

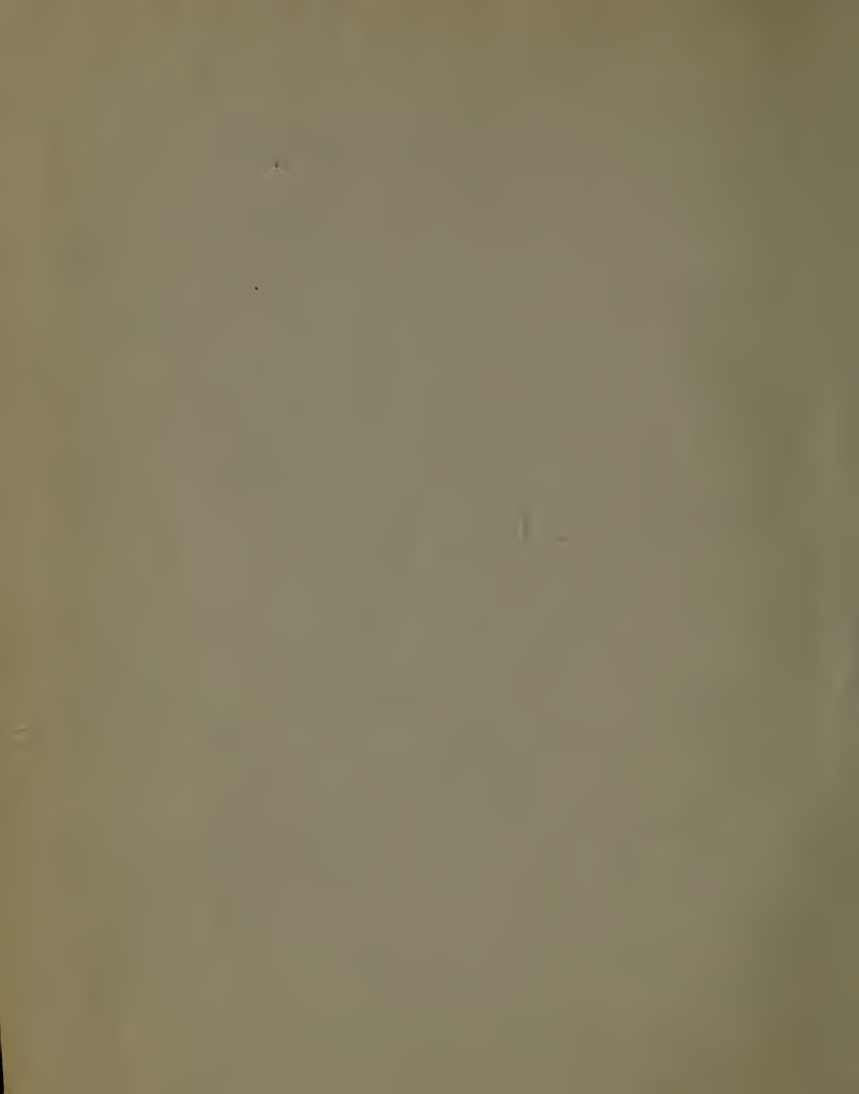
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The Lowell Textile School

Lowell, Mass.

1897-1900

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Programme
Session of 1897



LOWELL TEXTILE SCHOOL

LOWELL, MASS.

Programme for the Fall Session of 1897.
One Term.

PARKER BLOCK,
MIDDLE AND MERRIMACK STREETS.

Principal Entrance:
MASONIC BUILDING, NO. 128 MERRIMACK STREET.

TRUSTEES OF THE LOWELL TEXTILE SCHOOL

(INCORPORATED.)

Officers 1896-97.

A. G. CUMNOCK, PRESIDENT.

A. G. POLLARD, TREASURER.

JAMES T. SMITH, CLERK.

Trustees

On the Part of the Commonwealth of Massachusetts.

AUGUSTUS LOWELL, ESQ.

HOWARD STOCKTON, ESQ.

Trustees Ex-Officio.

HON. WM. F. COURTNEY,
Mayor of Lowell.

A. K. WHITCOMB,
Supt. of Schools, Lowell.

Trustees.

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FREDERICK E. CLARKE.

EDW. D. HOLDEN.

J. W. C. PICKERING.

C. P. BROOKS, Director of the School.

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The Lowell Textile School.

The establishing of a school at Lowell for thorough instruction in the theory and practical art of manufacturing all fibres known to the textile industry, although proposed early in 1891, was not determined upon until the organization, methods and scope of such foreign schools, especially in England, France, Switzerland, Germany and Russia, had been carefully studied, and their permanence and importance to the textile interests of those countries made clearly apparent.

The success attending the Textile School which is developing at Philadelphia, and the benefits derived by the industry from the Lowell School of Applied Design, established and maintained at Boston by Augustus Lowell, Esq., who is one of the representatives of the State of Massachusetts in our corporation, left no room for doubt that American conditions were favorable to the establishment of, in fact imperatively demanded, a textile school here.

The "Trustees of the Lowell Textile School" are incorporated under a special act of the Massachusetts legislature, "for the purpose of establishing and maintaining a Textile School for instruction in the theory and practical art of textile and kindred branches of industry."

The incorporators, with but two exceptions, are gentlemen repre-

senting either as president, director, treasurer, agent or superintendent, the management of great textile corporations of Lowell, Lawrence and vicinity in the Merrimack valley, with an aggregate capital of over \$25,000,000. By the terms of the By-laws, at least three-fourths of the Trustees must be "persons actually engaged in or connected with textile or kindred manufactures." This insures the practical character of the management and instruction.

The school is located at Lowell, Massachusetts, the "Mother Textile City of America," the city and state affording financial aid in its establishment, and the manufacturers of New England being equally liberal in their contributions. The advantages of the location of the school at a textile centre where every commercial fibre enters into the products, the student thus being directly in touch with the industry and the management thereof, will be apparent.

The Trustees have been fortunate in obtaining the services of Christopher P. Brooks as Director of the School, a gentleman of large experience as an instructor and examiner of English schools and in the equipping of foreign and American mills.



The Work of the School.

The object of the school is to give instruction in the practical knowledge necessary in the cotton, woolen, worsted and other textile industries, in sciences and art as applied to these industries, and in the processes and methods for the purpose of improving any special trade, or of introducing new branches of industry. It is essentially a trade school, and the whole plan provides for such instruction only as will be found useful in textile trades.

Science and art will be taught, but not with the object of educating professional and scientific men, but with a view to industrial and commercial applications ; but the school offers to graduates of universities and scientific institutions an opportunity of technical instruction in the practical application of certain branches of science.

The equipment of the school consists of high grade machinery with all latest improvements, specially built to afford facilities for all kinds of experimental work, and of such variety as is seldom found in any one textile mill. When all the machinery that is already arranged for is installed, the school will have a more extensive equipment of machinery and plant than any other existing textile school either in America, Europe or Asia.

The staff of lecturers and instructors will consist of men who in

addition to their special experience in textile school work have been for years practically engaged in mill work as manager, designer, or in other capacities, and it is the object of the trustees to give technical instruction that shall be equal to that of the best European schools. and at the same time of a thoroughly practical nature.

The operation of the school will be in three directions :—

First, Day Classes. These are especially intended for the instruction of young men whose intention it is to enter the business of textile manufacturing in any branch, and who have not been engaged in a textile trade, or who have already been engaged in such business and wish to improve their knowledge and opportunities, and who are able to devote their entire time to study. The complete collection of machinery enables every process to be practically illustrated. Certain of the evening classes will be considered as part of the course of the day students, especially in subjects for which facilities do not exist for day instruction.

The course is intended to extend over three years, and the instruction given this term will be preliminary to further instruction in two succeeding winters. It is optional whether a student attends the full course of three years, but this is strongly recommended.

The second branch of the school work is intended to give thorough evening instruction to those who are engaged during the day in mills and work shops in the Merrimack valley, to enable those who

wish it to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they are engaged in the day time, and, in the course of several winters, a thorough technical education at a low cost, and without interfering with their daily labor.

The third means of encouraging textile instruction will be by a course of popular lectures, of which details are given on page 31. These lectures will be given by recognized authorities in the branches of which they treat, and afford an opportunity to the students in the school, and inhabitants of Lowell and district, who do not care to take a regular course, to attend popular illustrated textile lectures. Students who are able are recommended to take a day or evening course in addition to attending the above lectures.

Lecturers and Instructors.

An able staff of experienced lecturers and instructors will, with Professor C. P. Brooks as principal lecturer, capably represent each department of textiles.



Buildings and Equipment.

The school building is capacious and well equipped with elevators, electric light and steam heat, and while arranged especially for school purposes, yet maintains many features of a textile mill in being of mill construction throughout, and having the sprinklers, electric motors, shafting and belting, electric and gas lighting, humidifiers, all installed in the most approved manner, and in some instances having each room equipped differently to give students an opportunity of comparing different systems.

The equipment of machinery is arranged so as to be the most complete of its kind in the world for textile educational purposes, the machinery and plant already arranged for is of a value of \$50,000, and is such as will enable raw cotton or wool to be treated in the school at every process until it becomes a woven fabric. The fact that there has been, or will be in the near future, placed in the school machinery from the shops of the following firms is satisfactory proof of its excellence :

The Lowell Machine Shop, of Lowell, Mass.

The Whitin Machine Co., of Whitinsville, Mass.

The Mason Machine Works, of Taunton, Mass.

The Crompton Loom Works, of Worcester, Mass.

The Atwood Machine Co., Stonington, Conn.

Davis & Furber Machine Co., North Andover, Mass.

Torrance Mfg. Co., Harrison, N.J.

G. S. Harwood & Sons, Boston, Mass.

The Knowles Loom Works, of Worcester, Mass.

The Kitson Machine Co., of Lowell, Mass.

George Draper & Sons, of Hopedale, Mass.

T. C. Entwistle, of Lowell, Mass.

Other leading makers of high grade machinery will also be fully represented.

Fees.

The fee for the day classes is \$50.00 for the term (from February to June, 1897), and there are no other charges, excepting that students must provide their own books, stationery and tools, and pay for any breakage or damage that they cause.

The above fee also includes attendance at certain evening classes, which form part of the day students' course, and also, by permission of the director of the school, free admission to any evening classes in which there is accommodation, and which the day student desires to attend.

In the evening school students may take up any subject, or group of subjects, at fees from fifty cents to \$5.00, details of which will be found on pages 27 to 30.

The evening school fees include the privileges of using the library and reading-room, and of attending certain extra lectures free of

charge, and there is no further payment to be made beyond the specified fees, excepting that students have to provide their own books, stationery and tools, and pay for breakages.

The fees in the evening classes are nominal, and are intended to defray little more than cost of material used by the students.

The fees are strictly payable in advance, and are in no case returnable except by vote of the trustees.

Entrance Examinations and Eligibility of Students.

Applications will not be considered if candidates are under fourteen years of age, but students may be of either sex and of any nationality. Those who have completed an ordinary grammar school course or high school course, and possess certificates to that effect, will be received in the school as students without examination, but all others will be expected to sit at an entrance examination, the date of which will be announced later. To pass this examination candidates for either day or evening classes will be required to possess a knowledge of English composition and arithmetic, including fractions. A good elementary education, combined with a knowledge of drawing, either freehand or mechanical, is of great assistance, and in the case of would-be evening students in the Textile school, it will be advisable in some cases to attend a year at the Lowell Evening High school and Drawing school prior to entering the Evening Textile school. The ultimate success in the latter school will probably be greater than if the student enters without such instruction.

The Director will be pleased to advise candidates as to the best course to take, and to give an opportunity for consultation on this and other points will be present at the school on Thursday and Friday, January 21 and 22, from 2 to 5 and 7 to 9 P. M.

Day students who are deficient in knowledge of drawing, may study same in the evening, as explained on page 26.

Examinations. Test examinations will be held at mid-term, and a final examination at the end of the session. The results of the final examination will be considered in the grading of the student at the end of his three years' course in the school.

Students from a distance, requiring rooms and board in the city, may if they desire it, select same from a list of houses which is kept at the school. These houses have been visited and approved by the Director, or other representative of the school. The cost of rooms and board in a good district is from \$4 per week upwards.

Conduct. Day students will be expected to attend all lectures, classes and demonstrations of practical work, except when permission to be absent has been obtained from the Director. In case of sickness, or other unavoidable absence, written explanation must be sent. When specially required by parents, cases of absence will be reported daily.

Books will be prescribed for entry of lecture notes and other exercises, and will be periodically examined by the lecturers. Day

students will be expected to spend two hours daily out of school hours, in home study and entering up notes and exercises. The care and accuracy with which these books are kept will be considered in the final examinations.

In the case of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly conduct, or profane or indecent language, will be considered good and sufficient reasons for the removal of a student from the school, and for the forfeiture of all school privileges, if the President of the school so decides.

Library.

The school library is supplied with all the leading textile books and with works dealing with sciences, art, or industries allied to the textile trades. The leading textile trade papers, both European and American, will be obtained. The library will be open to duly qualified students of the school throughout the day and evening.

Length of Session.

The first session of the day school will consist of one term only, from February 1st, 1897, to June 3d, 1897. In the succeeding years, it is intended to have a session from October to June, divided into two terms.

A schedule will be prepared showing how the school hours will be divided and the amount of time to be devoted to each subject.

The students will be required to attend at such hours as the Director shall, from time to time determine, and prepare such home exercises as are required by the Lecturer or Instructor in each department.

The register will be marked at the beginning of each lecture or demonstration and reports made periodically of students' attendance.

The above applies to the day classes only.

The evening classes will be held from February 8th to April 30th, and at the hours named on pages 27 to 30.

The school will be closed on Washington's Birthday, February 22d, two or three days in April, and on Decoration Day, May 30th.



General.

All raw stock and yarn will be provided by the school and all the productions of the school remain, or become, the property of the Trustees, except by special arrangement, but each student will be allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated as prescribed by the Director, and facilities will be given for the preparation of collection of such fabrics as are produced in the school, with all instructions for their manufacture. It is understood that the Trustees may retain in the school such other specimens of student's work as the Director may determine.

Lock boxes will be provided, free of charge, for the use of the students, sufficiently capacious to contain clothing, books and tools.

No books, instruments, or other property of the school, will be loaned to students, or allowed to be removed from the premises.

Facilities will be given for visits by day students to New England mills and works during the session.

Text books will be recommended by the teachers, and students are expected to purchase these, and also such tools and instruments as may from time to time be required for their own use. The cost of these, for day students, will be from \$10.00 to \$15.00, and for evening students, from \$2.00 upwards, according to the subjects studied.

Instruction.

First Year Course.

The following is the course of instruction that will be followed in the first session.

Day Classes.

1. Course of lectures on Cotton, Cotton Spinning, Machinery and Process. Subjects :

The structure of the cotton fibre.

Varieties of cotton produced in various parts of the world, and leading characteristics of same.

The selection of cotton, testing raw cotton.

Hand and mechanical methods of mixing and distributing cotton from the bale.

The construction of openers and automatic feeders.

The construction of breaker lappers.

The construction of finisher lappers.

The operation and care of picking machinery.

Theory of carding and development of carding machinery.

The stationary top card.

The roller and clearer card.

The revolving top card.

Card grinding, setting, stripping, and care of cards.

Construction and use of the railway head.

Principle of drawing, processes.

Construction and care of the drawing frame.

2. Practical work on machines named in above lectures timed to correspond with lecture course.

3. Course of lectures on Weaving Machinery and Processes, as used for cotton, woolen and worsted, including warp preparation.

Subjects :

Varieties and forms of yarn as used for weaving.

The construction and use of spooling machinery.

The construction and use of warpers of various kinds.

The slasher, its construction and use.

Sizing materials and size mixing machinery.

Other systems of warp preparation for special purposes.

Drawing-in and twisting.

The hand loom and the development of the power loom.

The plain power loom and its construction.

Shedding by tappets.

Various picking motions.

Fast and loose reeds, take-up and let-off motions.

Minor attachments to the plain loom.

Looms constructed for several shuttles.

Drop box motions.

Circular box motions.

Timing, setting and fixing one part in relation to another.

4. Practical Work on Spoolers, Warpers, Slashers, Dressers and Power Looms, cotton, woolen and worsted, timed to correspond with the respective lectures.

5. Lessons on Calculations for Cotton Spinning Machinery and Processes, and Weaving Machinery. Subjects :

Speeds of shafts in motion.

Alterations to speeds of shafts and parts of machines.

Principle of numbering yarn and tables for same.

Numbers, or hanks, of laps, slivers, bobbins, or yarn.

Number of total doublings and drafts.

Percentage of loss in weight of stock at various processes.

Speeds and drafts on picker machinery.

Speeds and drafts on the card, length of fillet required.

Alterations to weight of sliver.

Comber, derby doubler and sliver lap machine calculations.

Drafts and speeds of slubber and spooler.

Changes of twist and other gears, constant numbers, turns per inch.

Similar calculations for mule and ring spinning.

Arranging mill machinery, in relation to production, suitable drafts and weights of stock.

Cost of production and other mill statistics.

Doubling calculations, numbers of folded or ply yarn.

Calculations on the make-up of yarns in warps or skeins.

Speeds and changes on warpers, spoolers and looms.

Take-up calculations for looms.

Size of shed and size of tappet on looms.

6. Course of lessons on Weaving Calculations and Fabric Calculations. Subjects :

The uses of textile calculations, methods of naming or counting cotton, worsted and linen.

Methods of naming woolen yarns.

Methods of naming silk yarns.

Comparative calculations for converting one system into that of another.

Calculations for folded or ply yarns.

Calculations for the cost of folded or ply yarns, and quantities of each required to produce a given weight.

Calculations to find weight, count or length of warp, from given data.

Calculations for reeds.

Calculations for harness, straight, centred, or pointed draft.

Calculations for harness, spaced and in combinations.

Calculations for shrinkage, or contraction.

Calculations for the quantities of material required to make plain and striped warps.

Calculations for the quantities of weft required to make plain and checked fabrics.

Calculations to find the number of ends per inch in order to use a given weight of warp, also picks per inch to use a given weight of weft.

Winding, warping, slashing, drawing-in and twisting.

Cost of grey cloth.

Cost of colored cloth.

Calculations on the proportioning of fabrics.

Methods of determining the extent of adulterations found in yarn and cloth.

Testing the warp and filling in a fabric to ascertain the counts.

Analysis of fabrics for ends, picks, counts of warp and filling, with the quantities of each required, and other necessary particulars for the reproduction of cloth.

7. Course of lectures on cloth construction and designing in Cotton, Woolen and Worsted. Subjects :

Classifications of fabrics.

Plain fabrics and fabrics on a plain cloth basis.

Names and explanation of different parts of cloth and terms applied to weaves, etc. Point or design paper.

Methods of representing weaves, drafts, etc., on paper.

Explanation of harness and chain drafts.

Twill cloth and combinations of same.

Broken twills.

Sateens.

Combination of weaves.

Figured weaving in general.

Diapers, toweling, velveteens, coatings, trouserings, and goods made on tappet looms.

Colored goods, stripes.

Checked goods.

Cloth made with, or ornamented by, extra warp.

Cloth ornamented by extra filling.

8. Practical Work and teaching on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc., on paper.

9. Practical Work on hand looms, putting into operation the principles taught in the foregoing course.

10. Lectures on color in textiles and applied art. Subjects :

Color in relation to textiles.

Harmony of color.

Contrast of color.

Principles of coloring and shading.

Color as applied to stripes and checks.

Color as applied to floral and geometrical designs, and a continuation of this according to progress made by students.

Science.

11. Applied mechanics.

General.

Additional courses of lectures will probably be arranged for and delivered in the evening on processes connected with textiles, such as dyeing, bleaching, printing and finishing and on mill engineering. These will be considered as part of the regular course, and students will attend same.

Arrangements will also be made for students to have instruction two evenings per week in drawing. Freehand drawing for those intending to become designers, and mechanical drawing for those who intend to follow other branches of textile manufacturing.

First Year Course. Evening Classes.

The plan of evening instruction includes all the subjects taught in the day classes, with several additional ones, but as the time at the disposal of those who work in the mill is limited, there is no necessity or even possibility of taking all the subjects in one session. Certain groupings of subjects have been arranged, and it is strongly recommended that those who have the time to devote take up a group and not a single subject. The fees charged for each subject include the whole course in that subject, and are arranged so low in most cases as to merely cover cost of material used.

Spinning.

1. Course of lectures on Cotton, Cotton Spinning, Machinery and Processes.

For lists of subjects see page 21.

Fee for this subject \$1.00.

Wednesday evenings. Seven o'clock till eight o'clock.

2. Practical work on machines named in above lectures, timed to correspond with lecture course.

Fee for this subject, together with No. 1, \$2.00.

Friday evenings. Seven o'clock till nine o'clock.

3. Lessons on Calculations for Cotton Spinning Machinery and Processes.

For lists of subjects, see page 23.

Fee for this subject, \$1.00.

Wednesday evenings. Eight o'clock till nine o'clock.

The above three form the Cotton Spinning group, for which the total fee is \$2.50.

Weaving.

4. Course of lectures on Weaving Machinery and Processes, as used for cotton, woolen and worsted, including warp preparation.

For subject of lectures, see page 22.

The fee for this subject is \$1.00.

Monday evenings. Seven o'clock till eight o'clock.

5. Practical work on spoolers, warpers, slashers, dressers, and power looms, cotton, woolen and worsted, timed to correspond with the respective lectures.

The fee for this subject, together with No. 4, is \$2.00.

Tuesday evenings. Seven o'clock till nine o'clock.

6. Lessons on Calculations connected with Machinery.

The fee for this subject is \$1.00.

Wednesday evenings. Eight o'clock till nine o'clock.

The above forms the Weaving group, for which the total fee is \$2.50.

Designing. 7. Course of lectures on cloth construction and designing in both Cotton, Woolen and Worsted.

For list of subjects, see page 25.

Tuesday evenings. Seven o'clock till nine o'clock.

8. Practical work and teaching on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc. on paper.

Wednesday evenings. Seven o'clock till nine o'clock.

Subjects Nos. 7 and 8 may be taken together, and the fee for same is \$3.00.

9. Course of lessons on Weaving Calculations and Fabric Calculations.

For list of subjects, see page 23.

Fee for this subject is \$1.00.

Monday evenings. Seven o'clock till eight o'clock.

10. Practical Work on hand looms, putting into operation the principles taught in the foregoing courses.

Fee for this course is \$3.00.

Friday evenings. Seven o'clock till nine o'clock.

11. Lectures on color in textiles and applied art.

For list of subjects, see page 26.

Monday evenings. Eight o'clock till nine o'clock.

Fee for this subject is \$1.00, and combined fee for the whole design course is \$5.00, payable in advance.

Science.

12. Course of teaching in applied mechanics.

Fee for this subject is \$1.00.

Monday evenings. Eight o'clock.

General.

It is proposed to organize several other courses of lectures, including processes connected with the textile industries, such as cotton dyeing, bleaching and finishing, woolen dyeing, woolen and worsted cloth finishing, hosiery manufacture, steam and water power and transmission of power.

The fee for such of these as can be arranged, will be fifty cents the course, but recognized day and evening students, taking at least two other subjects, will be admitted to special lectures free, and will also be admitted to the popular lectures free, providing that their dues are all paid.



Free Popular Lectures.

Free popular lectures have been arranged for and will be delivered in the Lecture Hall of the School at intervals. Among the lectures already decided on are :— An opening address.

INDUSTRIAL EDUCATION.

By S. N. D. North, Esq., Secretary of the National Association of Wool Manufacturers.

LECTURE ON TEXTILE FIBRES.

By Hy. G. Kittredge, Esq., Editor Industrial Record.

LECTURE ON WOOL AND THE WOOL FIBRE.

By W. D. Hartshorne, Esq., Superintendent of the Arlington Mills, Lawrence, and addressees from other gentlemen.

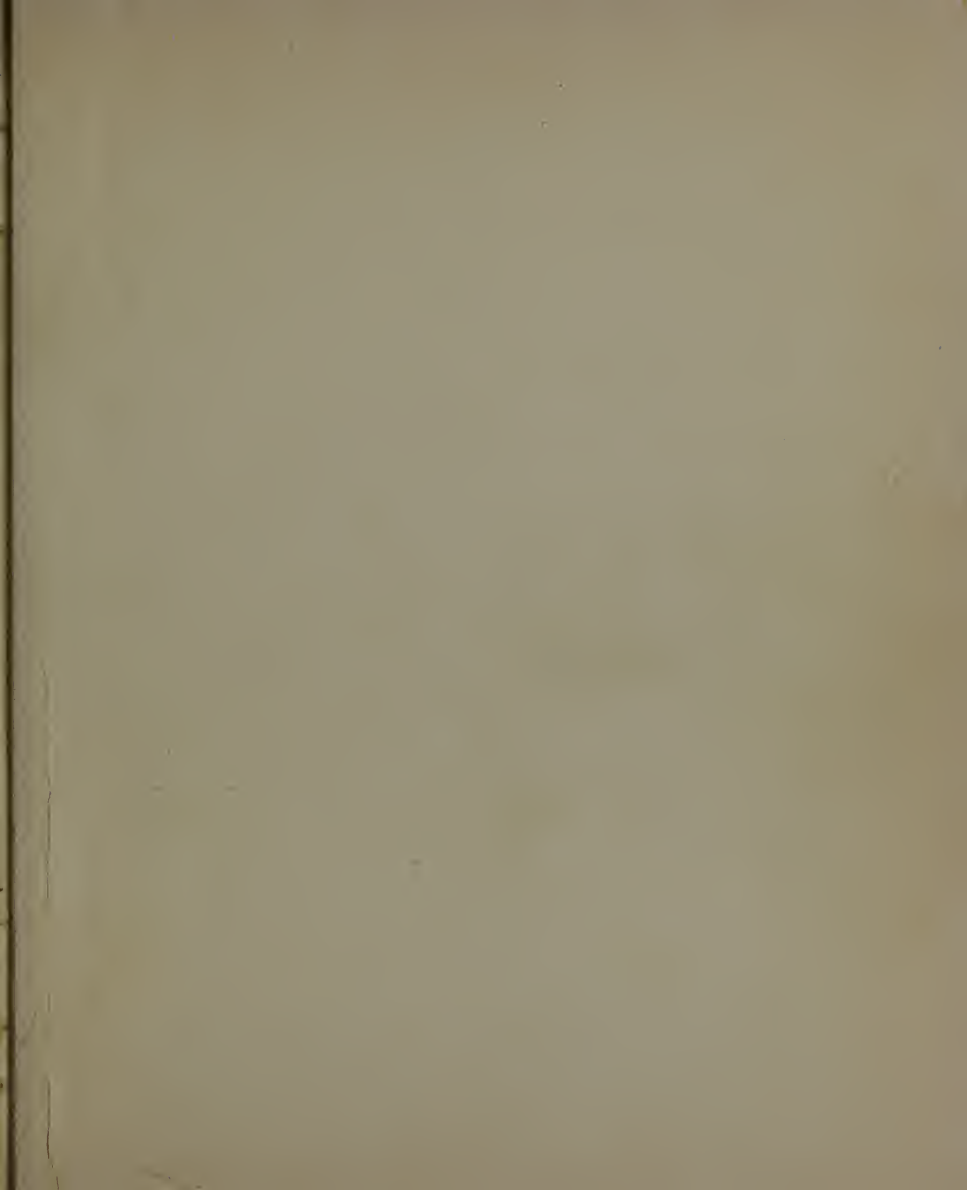
Admission will be free, by tickets to be obtained on application at the school.

Note to Second Edition.

Since the first edition of this programme was printed Mr. Fenwick Umpleby, of Gilbertville, Mass., has been appointed assistant instructor and Mr. Samuel Holt a weaving instructor.

BUTTERFIELD PRINTING & BINDING CO., LOWELL, MASS.







COTTON ROOM.

Trustees of the Lowell Textile School.

(INCORPORATED.)

Officers 1897-98.

A. G. CUMNOCK, PRESIDENT.

A. G. POLLARD, TREASURER.

JAMES T. SMITH, CLERK.

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HON. J. W. BENNETT,
Mayor of Lowell.

A. K. WHITCOMB,
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FREDERICK E. CLARKE.

EDW. D. HOLDEN.

J. W. C. PICKERING.

Christopher P. Brooks, Director of the School.

School Staff.

Director of the School,
PROFESSOR C. P. BROOKS.

Principal of the Chemistry and Dyeing Department,
PROFESSOR LOUIS A. OLNEY. ✓

Principal of the Cotton Department,
PROFESSOR C. C. HEDRICK.

Principal of the Decorative Art Department,
PROFESSOR VESPER L. GEORGE. ✓

Principal of the Designing, Woolen and Worsted Department,
PROFESSOR FENWICK UMPLEBY.

Principal of the Department of Mechanics,
PROFESSOR W. W. CROSBY.

Principal of the Weaving Department,
WILLIAM NELSON.

Assistant in Chemistry and Dyeing Department,
M. J. BUCHER.

Assistant in Cotton Department,
H. McDERMOTT.

Assistant in Design Department,
A. J. PEASE.

Instructor in Hand Loom Department,
SAMUEL HOLT.

Assistant in Weaving Department,
F. L. LEAVITT.

Assistant in Woolen and Worsted Department
THOMAS E. AINLEY.



Calendar.

1897.

Wednesday, September 15. Entrance examinations for day students at 10 a. m.

Wednesday, September 15. Entrance examinations for evening students at 7 p. m.

Monday, October 4. Beginning of Fall Term.

1898.

Thursday, January 27. End of Fall Term.

Monday, January 31. Stated meeting of Corporation.

Monday, January 31. Beginning of Spring Term.

Friday, June 3. End of Spring Term.

Wednesday and Thursday, November 24 and 25. Mid-term examinations for day classes.

Wednesday and Thursday, January 26 and 27. Term examinations for day classes.

Wednesday and Thursday, March 30 and 31. Mid-term examinations for day classes.

Thursday and Friday, May 5 and 6. Final examinations for evening classes.

Wednesday and Thursday, May 25 and 26. Final examinations for day classes.

Vacations.

All legal holidays, from December 21 to January 4, two days in April, and two days after each examination.

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The Lowell Textile School.

The establishing of a school at Lowell for thorough instruction in the theory and practical art of manufacturing all fibers known to the textile industry, although proposed early in 1891, was not determined upon until the organization, methods and scope of such foreign schools, especially in England, France, Switzerland, Germany and Russia, had been carefully studied, and their permanence and importance to the textile interests of those countries made clearly apparent.

The success attending the Textile School which is developing at Philadelphia, and the benefits derived by the industry from the Lowell School of Applied Design, established and maintained at Boston by Augustus Lowell, Esq., who is one of the representatives of the State of Massachusetts in our corporation, left no room for doubt that American conditions were favorable to the establishment of, in fact imperatively demanded, a textile school here.

The "Trustees of the Lowell Textile School" are incorporated under a special act of the Massachusetts legislature, "for the purpose of establishing and maintaining a Textile School for instruction in the theory and practical art of textile and kindred branches of industry."

The incorporators, with but two exceptions, are gentlemen representing either as president, director, treasurer, agent or superintendent, the management of great textile corporations of Lowell, Lawrence and vicinity in the Merrimack valley, with an aggregate

capital of over \$25,000,000. By the terms of the By-Laws, at least three-fourths of the Trustees must be "persons actually engaged in or connected with textile or kindred manufactures." This insures the practical character of the management and instruction.

The school is located at Lowell, Massachusetts, the "Mother Textile City of America," the city and state affording financial aid in its establishment, and the manufacturers of New England being equally liberal in their contributions. The advantages of the location of the School at a textile centre where every commercial fibre enters into the products, the student thus being directly in touch with the industry and the management thereof, will be apparent.

The Trustees were fortunate in obtaining the services of Christopher P. Brooks as Director of the School, a gentleman of large experience as an instructor and examiner of English schools and in the equipping of foreign and American mills.

The School was formally opened by Gov. Wolcott on January 30, 1897, in the presence of a large gathering of gentlemen interested in textile industries from all parts of New England. Instruction was commenced on February 1st, 1897, the number of students exceeding the most sanguine expectations.

The Work of the School.

The object of the School is to give instruction in the practical knowledge necessary in the cotton, woolen, worsted and other textile industries, in sciences and art as applied to these industries, and in the processes and methods for the purpose of improving any special trade, or of introducing new branches of industry. It is essentially a trade school, and the whole plan provides for such instruction only as will be found useful in textile trades.

Science and art will be taught, but not with the object of educating professional and scientific men, but with a view to industrial and commercial applications; but the School offers to graduates of universities and scientific institutions an opportunity of technical instruction in the practical application of certain sciences.

The equipment of the School consists of high grade machinery with all latest improvements, specially built to afford facilities for all kinds of experimental work, and of such variety as is never found in any one textile mill. When all the machinery that is already arranged for is installed, the school will have a more extensive equipment of machinery and plant than any other existing textile school either in America or Europe.

The staff of lecturers and instructors consists of men who in addition to their special experience in textile school work have been for years practically engaged in mill work as manager, designer, or in other capacities, and it is the object of the trustees to give technical

instruction that shall be equal to that of the best European schools, and at the same time of a thoroughly practical nature.

The operation of the School will be in four directions :

Day Classes. These are especially intended for the instruction of young men whose intention it is to enter the business of textile manufacturing in any branch, and who have not been engaged in a textile trade, or who have already been engaged in such business and wish to improve their knowledge and opportunities, and who are able to devote their entire time to study. The complete collection of machinery enables every process to be practically illustrated.

The student has the option of selecting any one of four courses.

Each course is intended to extend over three years. It is optional whether a student attends the full course of three years, but this is strongly recommended.

There will be *one term* of preliminary instruction, for first year students, which will be common to all courses.

The instruction given in this term will consist of Principles of Mechanism, Machine Drawing, Textile Calculations, Elementary Designing and Elementary Chemistry. Towards the end of this term, by January 1st, 1898, each student will be required to elect which of the four distinct courses he will follow in his subsequent studies, and the instruction to be given after the first term of the first year will be specialized to suit each course.

Full details of the plan of studies in each course are given on page 33 *et seq.*, and may be summarized as follows :

1st. The *Cotton Manufacturing Course*, includes cotton picking, carding, combing, spinning, warp preparation, and weaving on all varieties of looms, and textile calculations, chemistry and dyeing,

and the elements of designing. A full course in designing is optional instead of chemistry and dyeing.

2d. The *Woolen Manufacturing Course*, includes wool picking, carding, spinning, worsted combing, drawing, spinning, twisting, woolen and worsted warp preparation and weaving on all varieties of looms, textile calculations, chemistry and dyeing, and the elements of designing. A full course of designing is optional instead of chemistry and dyeing.

3d. The *Designing Course*, includes cotton, woolen and worsted warp preparation and weaving on all varieties of looms, and designing of textile fabrics, use of color in textiles, cloth analysis and reproduction, textile calculations, chemistry and dyeing.

4th. *Dyeing*. A course exclusively for chemistry, dyeing, printing, bleaching, etc., has been arranged. See page 64.

Each of the above courses will occupy three years to complete, including the first term of preliminary instruction.

Evening Classes.

The second branch of the School work is intended to give thorough evening instruction to those who are engaged during the day in mills and work shops, to enable those who wish it to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they are engaged in the day time, and, in the course of several winters, a thorough technical education at a low cost, and without interfering with their daily labor.

Evening students have the option of entering for one or more of five different courses.

1st. Cotton picking, carding, combing, and spinning, with calculations connected with same, and also including practical work on the machines named.

2d. Woolen carding, spinning, worsted combing, drawing and spinning, woolen and worsted twisting, including practical work on the machinery and calculations connected with same.

3d. Weaving on all varieties of looms, cotton, woolen and worsted, including woolen and worsted warp preparation, practical work on the machines named and textile calculations.

4th. Designing and cloth construction in all materials, cloth analysis and reproduction, color in textiles and textile calculations.

5th. Chemistry and dyeing.

Each of the above departments is covered by a two-year course.

It is aimed to make the instruction as thorough and practical as possible. Lectures are given illustrative of the machinery and processes under consideration and timed to correspond with practical work on the same machinery and processes.

It is possible to take up the study of two of the above evening courses concurrently.

The time devoted to practical work both day and evening is considerably longer than that devoted to lectures, and in order to make the instruction real and thorough, as far as possible, arrangements are made by which no student is allowed to pass forward to another machine or process until he becomes thoroughly acquainted with the one on which he is engaged.

Popular Lectures.

The third means of encouraging textile instruction will be by a course of popular lectures, of which details are given on page 61. These lectures will be given by recognized authorities in the branches with which they deal, and afford an opportunity to the students in the school, and inhabitants of Lowell and adjacent districts who do not care to take a regular course, to attend popular illustrated textile lectures. Students who are able are recommended to take a day or evening course in addition to attending the above lectures.

Women's Department.

The fourth branch is in the direction of a Women's Department. Special day classes, in art subjects, especially in textile designing are held. Details are given on page 60.



Buildings and Equipment.

The school building is capacious and well equipped with elevators, electric light and steam heat, and while arranged especially for school purposes, yet maintains many features of a textile mill in being of mill construction throughout, and having the sprinklers, electric motors, shafting and belting, electric and gas lighting, humidifiers, all installed in the most approved manner, and in some instances having each room equipped differently to give students an opportunity of comparing different systems.

The equipment of machinery is arranged so as to be the most complete of its kind in the world for textile educational purposes, the machinery and plant already arranged for is of a value of \$75,000, and is such as will enable raw cotton or wool to be treated in the school at every process until it becomes a woven fabric. The fact that there has been placed in the school machinery from the shops of the following firms is satisfactory proof of its excellence:—

The Lowell Machine Shop, of Lowell, Mass.

The Whitin Machine Co., of Whitinsville, Mass.

The Mason Machine Works, of Taunton, Mass.

The Crompton & Knowles Loom Works, of Worcester, Mass.,
and Providence, R. I.

The Atwood Machine Co., Stonington, Conn.

Davis & Furber Machine Co., North Andover, Mass.

Torrance Mfg. Co., Harrison, N. J.

Prince, Smith & Son, Keighley, Eng.
Stoddard, Haserick, Richards & Co., Boston, Mass.
G. S. Harwood & Sons, Boston, Mass.
The Kitson Machine Co., of Lowell, Mass.
George Draper & Sons, of Hopedale, Mass.
T. C. Entwistle, of Lowell, Mass.

Other leading makers of high grade machinery are also fully represented.

The equipment of the Cotton Department includes :

- One Automatic Feeder made by the Kitson Machine Co., Lowell, Mass.
- One single Beater Breaker, made by the Kitson Machine Co., Lowell, Mass.
- One Single Beater Finisher, made by the Kitson Machine Co., Lowell, Mass.
- One Top Flat Card, made by the Lowell Machine Shop, Lowell, Mass.
- One Revolving Flat Card, made by the Lowell Machine Shop, Lowell, Mass.
- Card Grinding Rolls, Stripping Rolls, etc.
- One Sliver Lap Machine, made by the Mason Machine Works, Taunton, Mass.
- One Ribbon Lapper, made by the Mason Machine Works, Taunton, Mass.
- One Comb, made by the Mason Machine Works, Taunton, Mass.
- One Railway Head, made by the Lowell Machine Shop, Lowell, Mass.
- One Drawing Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Slubber, made by the Lowell Machine Shop, Lowell, Mass.
One Intermediate, made by the Lowell Machine Shop, Lowell,
Mass.
One Fine Frame, made by the Lowell Machine Shop, Lowell,
Mass.
One Ring Spinning Frame, made by the Lowell Machine Shop,
Lowell, Mass.
One Spinning Mule, made by the Lowell Machine Shop, Lowell,
Mass.
One Spooler, made by the Lowell Machine Shop, Lowell, Mass.
Wet and Dry Twister, made by the Draper Co., Hopedale, Mass.
One Reel, made by the Whitin Machine Works, Whitinsville,
Mass.

The Woolen Spinning Department includes :

One Mixing Picker, made by the Davis & Furber Machine Co.,
North Andover, Mass.
One set of three Woolen Cards, including :—
First Breaker, with Bramwell Feeder, made by the Davis & Furber
Machine Co., North Andover, Mass.
Second Breaker, made by the Davis & Furber Machine Co., North
Andover, Mass.
Finisher, made by the Davis & Furber Machine Co., North
Andover, Mass.
One Improved Breaker Feed, made by G. S. Harwood & Sons,
Boston, Mass.
One Bramwell First Breaker Feed, made by G. S. Harwood &
& Sons, Boston, Mass.
One Torrance Balling Head and Creel, made by the Torrance
Mfg. Co., Harrison, N. J.

Apperly Feed, made by G. S. Harwood & Son, Boston, Mass.

One Spinning Mule, 120 spindles, made by the Davis & Furber Machine Co., North Andover, Mass.

One Twister, made by the Davis & Furber Machine Co., North Andover, Mass.

A complete worsted plant, including worsted card, comb and a full line of machinery has been arranged for and will be shortly installed.

The Cotton Warp Preparation Department consists of:

One Spooler, made by the Lowell Machine Shop, Lowell, Mass.

One Warper, made by the Lowell Machine Shop, Lowell, Mass.

One Slasher, made by the Lowell Machine Shop, Lowell, Mass.

One Beamer, made by Mr. T. C. Entwistle, Lowell, Mass.

Drawing-in Frames, etc.

The Woolen and Worsted Warp Preparation Department consists of:

One Warp Spooler, made by the Davis & Furber Machine Co., North Andover, Mass.

One Dresser, made by the Davis & Furber Machine Co., North Andover, Mass.

One Reel, made by the Davis & Furber Machine Co., North Andover, Mass.

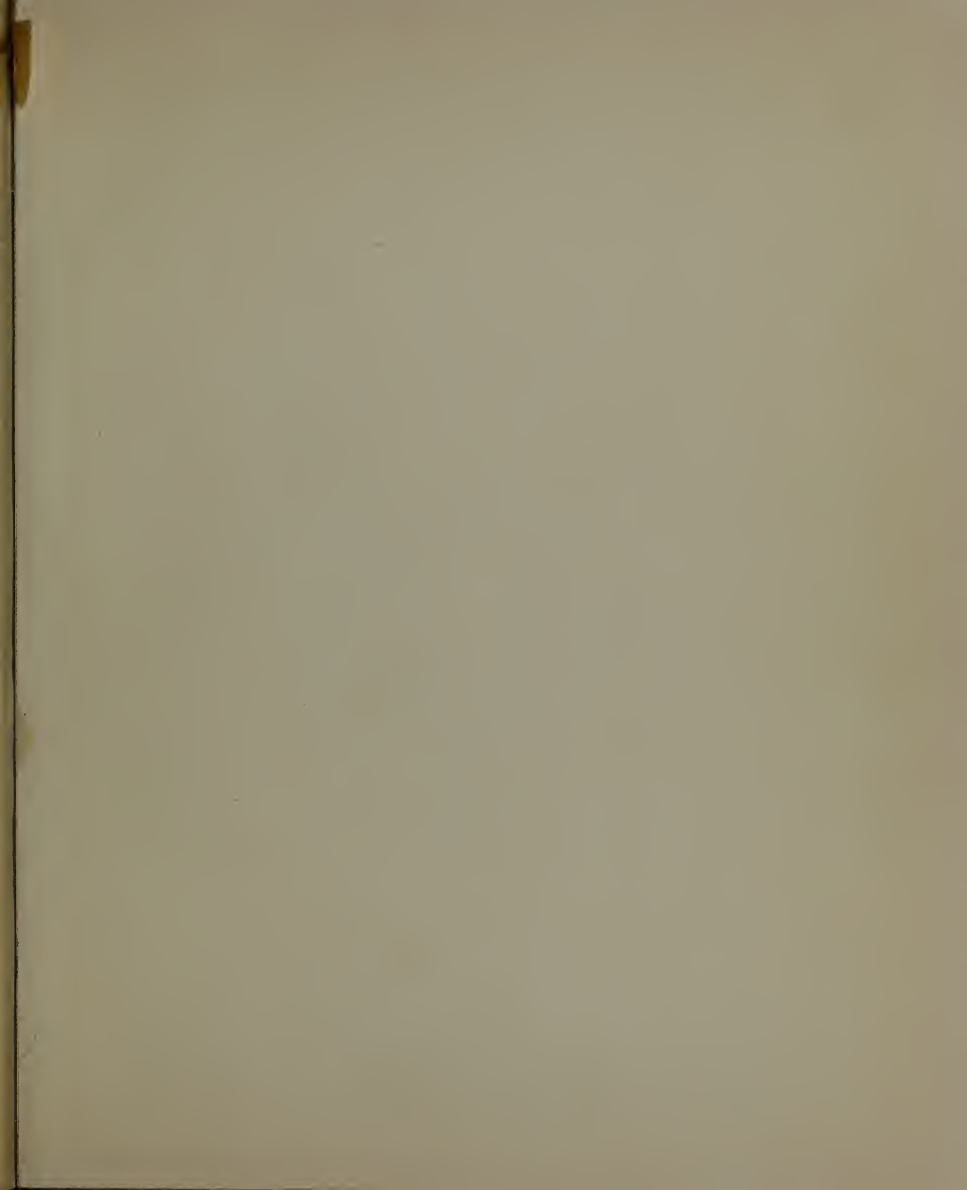
One Beamer, made by the Davis & Furber Machine Co., North Andover, Mass.

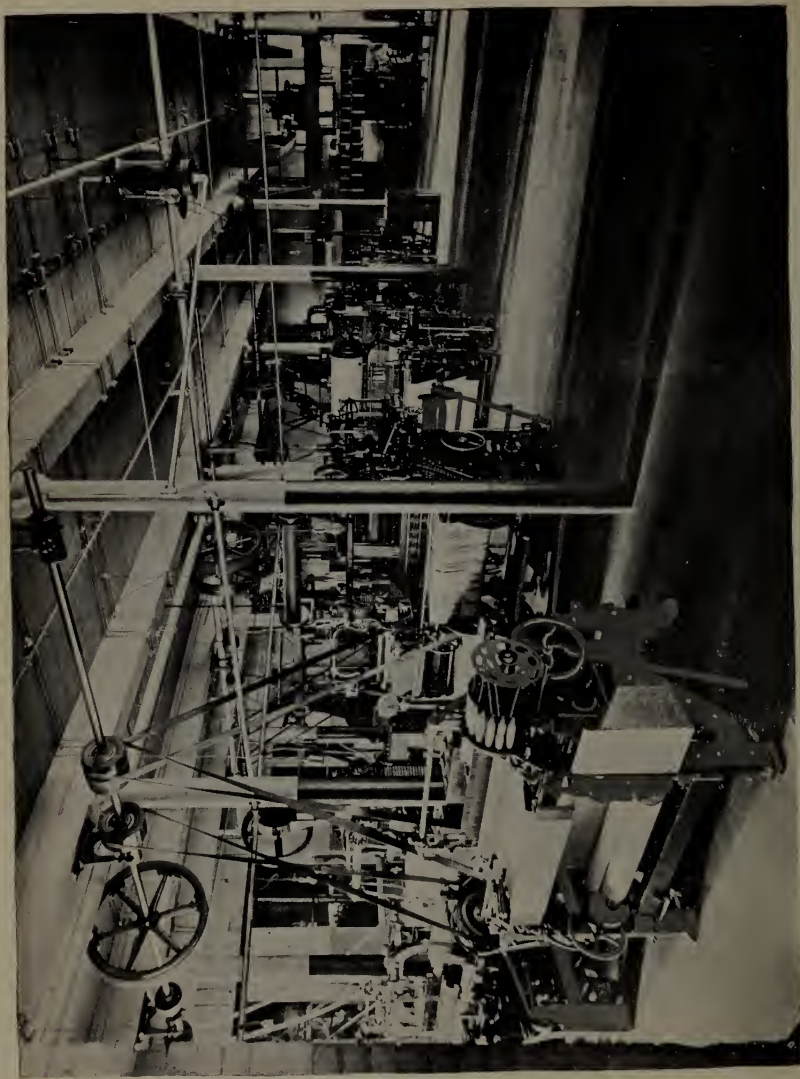
Also a number of hand warping and beaming frames.

The Weaving Department, which is one of the most complete in the world, having regard to the variety of looms, consists of:

One Plain Northrop Loom, made by the Draper Co., Hopedale, Mass.

- One Plain Print Cloth Loom, made by the Whitin Machine Works
Whitinsville, Mass.
- One Side Cam Twill Loom, made by the Whitin Machine Works,
Whitinsville, Mass.
- One Five Harness Heavy Loom, made by the Lowell Machine
Shop, Lowell, Mass.
- One Plain Print Cloth Loom, made by the Mason Machine Works,
Taunton, Mass.
- And the following looms, made by the Crompton-Knowles Loom
Works, Worcester, Mass., and Providence, R. I. :
- One Knowles Gingham Loom, 4 boxes.
- One Knowles Fancy Cotton Loom, with 20 harness dobbie, 4
boxes.
- One Knowles Fancy Cotton Loom, with 25 harness dobbie.
- One Knowles Blanket Loom, with 25 harness dobbie, 4 boxes.
- One Knowles Gem Loom, 20 harness, 4 x 4 boxes.
- One Knowles Worsted Loom, 32 harness.
- One Knowles Fancy Loom, with single lift jacquard.
- One Knowles Fancy Loom, with double lift jacquard.
- One Knowles Fancy Loom, with jacquard tied up for leno.
- One Knowles Ingrain Carpet Loom, 4 x 4 boxes.
- One Crompton Gingham Loom, 4 boxes.
- One Crompton Fancy Cotton Loom, 6 x 1, with double cylinder
20 harness dobbie.
- One Crompton Fancy Cotton Loom, with single cylinder 20 har-
ness dobbie.
- One Crompton Jean Loom.
- One Crompton Lappet Loom, with 16 harness dobbie.
- One Crompton Towel Loom.





VIEW IN WEAVE ROOM

One Crompton Ingrain Carpet Loom, 4 x 4 boxes.

One Crompton Worsted Loom, 27 harness.

There are also a number of hand looms, viz. :

Twelve Hand Looms, 2 x 3 boxes, with 20 harness dobby.

Eight Hand Looms, 4 x 4 boxes, with 24 harness dobby.

Six Hand Looms, 3 x 3 boxes, with 32 harness dobby.

Six Hand Looms, 4 x 4 boxes, with 30 harness dobby.

Two Hand Looms, 4 x 4 boxes, with 32 harness dobby.

Two Hand Looms, with treadles.

Two Hand Looms, 4 x 4 boxes, with 200 hook jacquard.

Two Hand Looms, 3 x 3 boxes, with 200 hook jacquard.

Two Hand Looms, 3 x 3 boxes, with 600 hook jacquard.

The Silk Machinery consists of :

One Winder, made by the Atwood Machine Co., Stonington, Conn.

One Quiller, made by the Atwood Machine Co., Stonington, Conn.

One Warper, made by the Atwood Machine Co., Stonington, Conn.

One Beamer, made by the Atwood Machine Co., Stonington, Conn.

One Doubling Frame, made by the Atwood Machine Co., Stonington, Conn.

One 30 horse-power Motor, by the General Electric Co., Schenectady, N. Y.

Two 20 horse-power Motors, made by the Westinghouse Electric and Manufacturing Co., Pittsburg, Pa.

One complete system of fire protection, including sprinklers, air

pressure system, thermostats, and other appliances, by the General Fire Extinguisher Co., Providence, R. I.

One complete humidifying plant, by the American Drosophore Co., Boston, Mass.

One complete humidifying plant, by the U. S. Aerophor Air Moistening and Ventilating Co., Providence, R. I.

The School is well equipped with reels, testers and scientific instruments for experimental purposes.

The Dyeing Department is fully equipped with complete chemical laboratory with individual benches, and also small machines for dyeing, and other processes.



Admission and Entrance Examinations.

Applications will be received from candidates not under fourteen years of age, and students may be of either sex or of any nationality. Those who have completed a grammar school, high school or other course of instruction satisfactory to the Director, and who possess certificates to that effect, will be received in the School as first year students without examination, but all others will be required to pass an entrance examination, which will be held in the case of candidates for the day classes, September 15, at 10 a. m., and for candidates for the evening classes on the same date at 7 p. m. No later examination will be held. Students possessing certificates named above, must present them at the School prior to September 14, and have their application blanks endorsed, or they will be required to sit at the entrance examination on September 15. This examination will be a test of the candidates' knowledge of arithmetic, including fractions, and of English, including reading and writing.

No entrance examination will be required in case of former students in the School.

A good elementary education, combined with a knowledge of drawing, either freehand or mechanical, is of great assistance, and in the case of would-be evening students in the Textile school, it will be advisable in some cases to attend a year at the Lowell Evening High school and Drawing school prior to entering the Evening Textile school. The ultimate success in the latter school

will probably be greater than if the student enters without such instruction.

The Director will be pleased to advise candidates as to the best course to take, and to give an opportunity for consultation on this and other points will be present at the School on Monday and Tuesday, September 13 and 14, from 10 a. m. to 12 m., 2 to 5 and 7 to 10 p. m.

Candidates will fill out application blanks which are to be found in this catalogue or which may be obtained at the School.

Fees. The fee for the day classes is \$50.00 per term, making \$100 for the school year. There are no other charges except that students must provide their own books, stationery, tools, overalls, etc., and pay for any breakage or damage that they cause. The above fee includes free admission to any of the evening classes in which there is accommodation and which the day student may desire to attend.

The fees for the evening classes vary and are indicated on pages 58 and 59.

For cost of books and tools see page 32. Fees are strictly payable in advance and no student will be admitted to the classes until his fees are paid and he has obtained a card of admission.

Examinations. Test examinations for the day classes will be held at mid-term and at the end of the fall term. A final examination will be held at the end of the spring term.

A final examination for the evening classes will also be held at the end of the spring term.

The results of these examinations will be considered in the grading of the student at the end of his three years' course in the School. Students who do not show sufficiently satisfactory progress in the final examination at the end of the first year will not be admitted to the second year's classes, and the same applies to second year students, with reference to their admission to the third year class.

Conduct.

Day students will be expected to attend all lectures, classes and demonstrations of practical work, except when permission to be absent has been obtained from the Director. In case of sickness, or other unavoidable absence, written explanation must be sent. When specially required by parents, cases of absence will be reported daily.

Books will be prescribed for study and for entry of lecture notes and other exercises, and will be periodically examined by the lecturers. Day students will be expected to spend two hours daily out of school hours, in home study and entering up notes and exercises. The care and accuracy with which these books are kept will be considered in the final examinations.

Students who do not show satisfactory work in the entry of these note books and design books, will be required to spend additional time in school in order that the home exercises may be worked under the supervision of the instructors. Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order.

In the case of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly conduct, profane or indecent language, or general insubor-

dination, will be considered good and sufficient reasons for the suspension of a student by the Director, and for his subsequent removal from the School and forfeiture of all school privileges, if the President of the School so decides.

Apparatus used in the Dyeing or Chemical Laboratory will be provided by the School, but a deposit must be made by the student at the beginning of the term sufficient to cover its cost, and this deposit will be returned to him at the close of the term, subject to such deduction as will reimburse the school for broken or damaged articles.

Library.

The School library is supplied with all the leading textile books and with works dealing with sciences, art, or industries allied to the textile trades. The leading textile trade papers, both American and European, are obtained. The library will be open to duly qualified students of the School in afternoons.

Length of Session.

The Fall term of 1897 will commence on Monday, October 4 and end January 27, 1898. The Spring term of 1898 will begin on January 31 and end on June 3. The day school will be in session from 9 a. m. to 1 p. m. each morning excepting Saturday. There will be afternoon sessions on certain days. There will be vacations on all legal holidays, also from Tuesday, December 21, to Tuesday, January 4, and also for two days after each examination.

A schedule will be prepared showing the time to be devoted to each subject and the hours at which the various classes meet. This will be rigidly adhered to and the register will be marked at the

beginning of each lecture or demonstration. Individual students may by special permit be excused from attendance at certain classes, but not in such a way as to reduce the fees payable.

General. Students from a distance, requiring rooms and board in the city, may if they desire it, select same from a list of houses which is kept at the School. The cost of rooms and board in a good district is from \$4 per week upwards.

All raw stock and yarn will be provided by the School and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student will be allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated as prescribed by the Director, and facilities will be given for the preparation of a collection of such fabrics as are produced in the School, with all instructions for their manufacture. It is understood that the Trustees may retain in the School such other specimens of student's work as the Director may determine.

Prospective students who are desirous of arranging special courses by omitting a portion of one course, adding a portion of another, or in any other way, are invited to communicate with the Director.

An additional entrance examination to suit the convenience of students from a distance (out of New England), has been arranged for October 1st.

Lock boxes will be provided, free of charge, for the use of the students, sufficiently capacious to contain clothing, books and tools.

No books, instruments, or other property of the School, will be loaned to students, or allowed to be removed from the premises.

Facilities will be given for visits by day students to New England mills and works during the session.

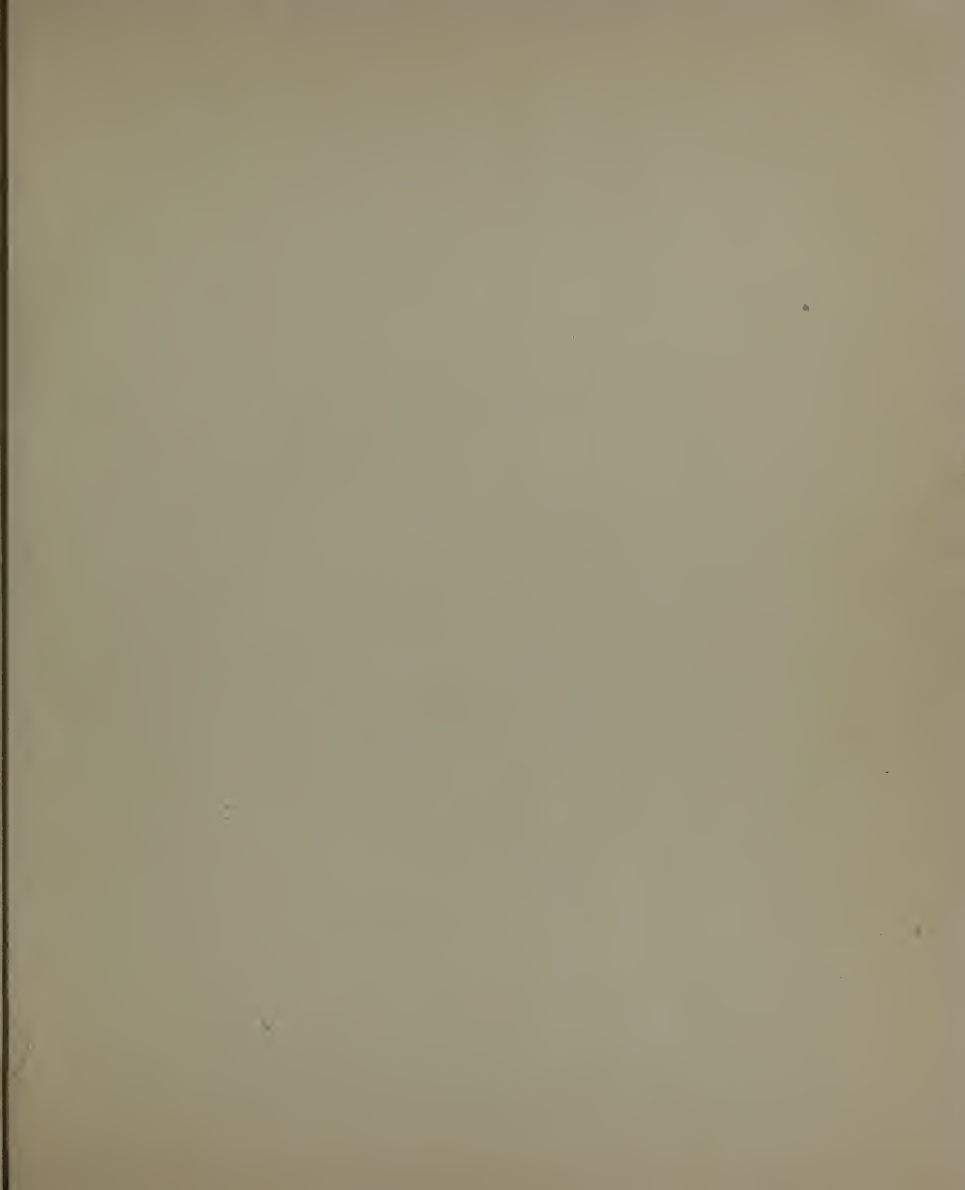
The following mills and workshops have been visited during the past term :—

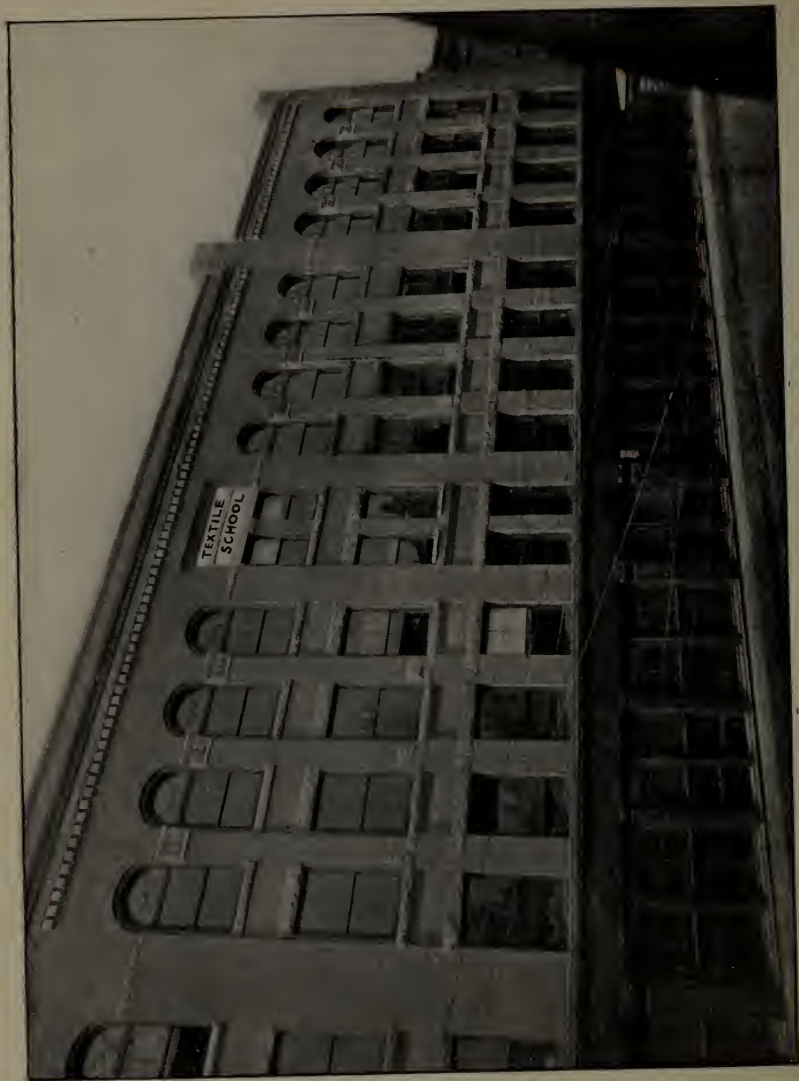
Tremont & Suffolk Mills, Lowell, Mass.
Washington Mills, Lawrence, Mass.
Lowell Manufacturing Company, Lowell, Mass.
Lowell Machine Shop, Lowell, Mass.
Kitson Machine Shop, Lowell, Mass.
Massachusetts Cotton Mills, Lowell, Mass.
Lowell Hosiery Company, Lowell, Mass.
Hamilton Print Works, Lowell, Mass.
Merrimack Print Works, Lowell, Mass.

Materials.

Students must purchase such tools, instruments, and text books and other apparatus as may from time to time be recommended by the teachers, and the cost of these for day students will be from \$10.00 to \$15.00, and for evening students from \$2.00 upwards according to the subject studied.







VIEW OF SCHOOL FROM MIDDLE STREET.

PLAN OF STUDIES, DAY CLASSES.

Cotton Manufacturing Course.

First Year.—First Term :

Primary Course Calculations.	}	Common to all Courses.
Primary Course Designing.		
Primary Course Applied Mechanics.		
Primary Course Chemistry.		
Primary Course Machine Drawing.	}	

Second Term :

Cotton Selection, Picking and Carding.
Spooling, Warping and Slashing.
Calculations.
Elementary Designing.
Applied Mechanics.
Machine Drawing.

Second Year.—First and Second Terms:

Combing, Drawing, Fly Frames, Ring Spinning and Mule Spinning.

Final Course Applied Mechanics.

Final Course Machine Drawing.

Plain Weaving.

Weaving on Dobby Looms, Box Looms, Towel Looms, and Instruction on Weaving Mechanism.

Textile Chemistry.

Final Course Calculations.

Final Course Machine Drawing.

Designing.

Third Year.—First and Second Terms:

Spooling, Twisting, Warping, Gassing, Bundling, Spinning Mill Construction and Equipment, and Mill Statistics.

Lappet, Leno and Jacquard Weaving, Weave Mill Engineering and Statistics.

Final Course Textile Designing, also General Research and Thesis Work.

(In the above course Dyeing is an optional subject instead of Designing, but students cannot take the full course in *both* Dyeing and Designing in addition to the above studies, excepting by attending the evening school in addition to the day school.)

Wool Manufacturing Course.

First Year.—First Term :

Primary Course Applied Mechanics.	}	Common to all Courses.
Primary Course Designing.		
Primary Course Chemistry.		
Primary Course Machine Calculations.		
Primary Course Machine Drawing.		

First Year.—Second Term :

Wool Sorting, Scouring, Carbonizing, Picking, Carding and Spinning.
Woolen and Worsted Spooling, Warping and Dressing.
Elementary Designing.
Machine Drawing.
Applied Mechanics.

Second Year.—First and Second Terms :

Worsted Carding, Combing, Drawing, Roving and Spinning.
Plain Weaving.
Weaving and Weaving Mechanism, including Dobby Looms and Box Looms.
Textile Chemistry.
Applied Mechanics.
Machine Drawing.
Machine Calculations.
Designing.

Third Year.—First and Second Terms :

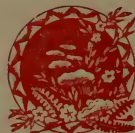
Wool and Worsted Mill Engineering and Statistics.

Weaving Mechanism, including Leno, Lappet, Carpet and Jacquard Looms, Weave Mill Statistics and Engineering.

Designing for Jacquards, Original Designing,^a and putting same into cloth.

General Research and Thesis Work.

(In the above course Dyeing is an optional subject instead of Designing, but students cannot take the full course in *both* Dyeing and Designing in addition to the above studies, excepting by attending the evening school in addition to the day school.)



Designing Course.

First Year.—First Term :

Primary Course in Machine Drawing.	}	Common to all Courses.
Primary Course in Applied Mechanics.		
Primary Course in Calculations.		
Primary Course in Design.		
Primary Course in Chemistry.		

Second Term :

Cloth Construction and Designing in Cotton, Woolen and
Worsted.
Fabric Calculations.
Hand Loom Work.
Applied Mechanics.
Instruction in Art Department, Free Hand Drawing and Color.
Spooling, Warping, Slashing and Dressing.
Chemistry and Dyeing.

Second Year.—First and Second Terms :

Cloth Construction and Designing in Cotton, Woolen and
Worsted.
Fabric Calculations.
Art Department.
Hand Loom Work.
Plain Weaving, Dobby and Drop-box Looms, and Instruction on
Weaving Mechanism.
Dyeing.

Third Year.—First and Second Terms :

Designing, including Jacquard Work.

Weaving Mechanism, including Leno, Lappet, Carpet and Jacquard Looms, also Weave Mill Statistics and Weave Mill Construction.

Dyeing.

Original Work in Designing and in putting designs into looms.

Dyeing Course.

First Year.—First Term :

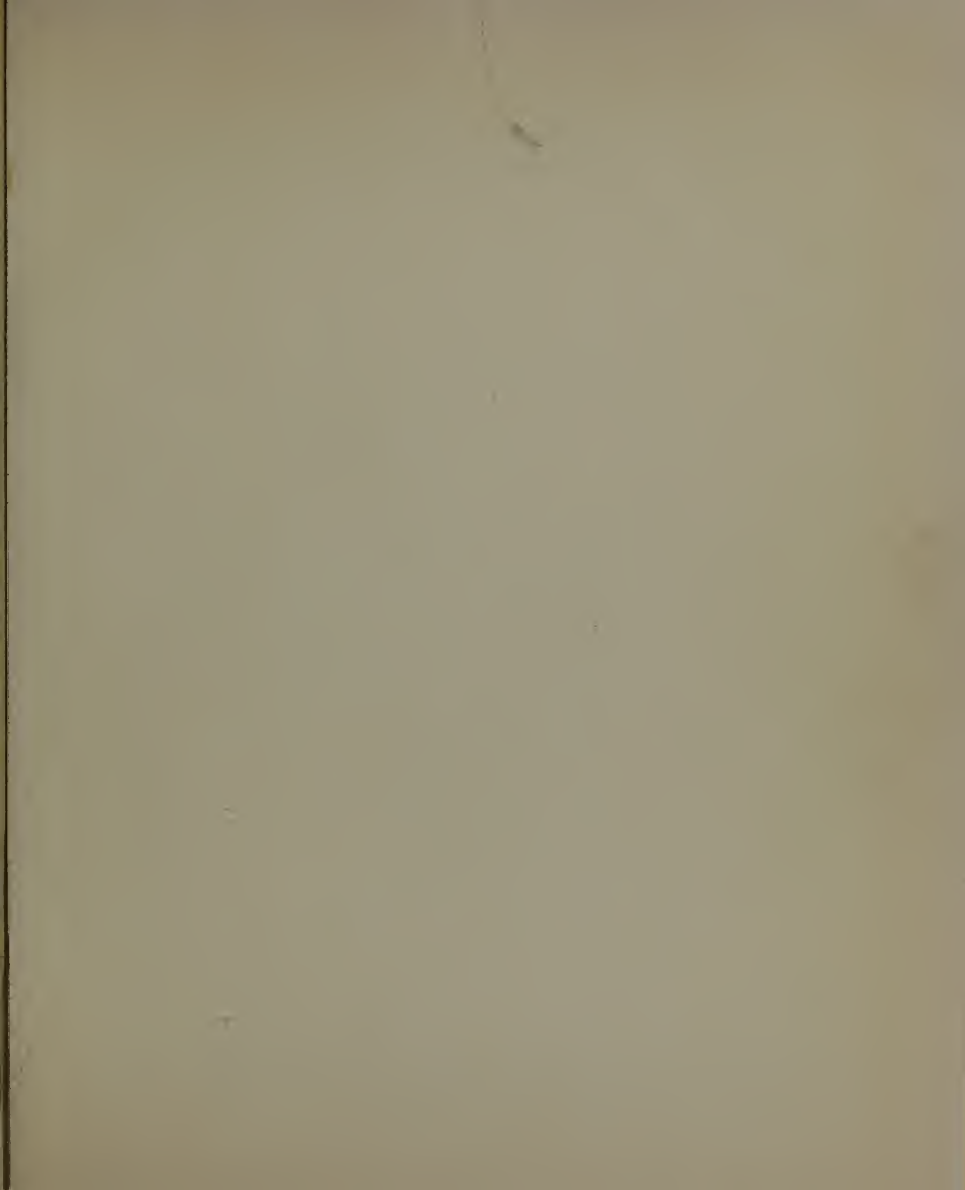
Primary courses as above.

First Year.—Second Term :

For plan of studies for this and succeeding years see page 65.



List of
Departments,
Lectures,
and
Practical Work.





CORNER OF COTTON ROOM.

Cotton Department.

PICKING, CARDING, COMBING, SPINNING AND TWISTING DEPARTMENT.

PRINCIPAL, PROF. C. C. HEDRICK.

First Year :

1. Course of Lectures on Cotton Cultivation and Ginning.
The cotton fibre.
Cotton selection.
Classification of cotton.
Varieties of cotton from different parts of the world.
Hand and mechanical methods of mixing and distributing cotton
from the bale.
The construction of the Automatic Feeder.
The construction of the Opener.
The construction of the Breaker.
The construction of Intermediate and Finisher Lappers.
The operation and care of Picking Machinery.
Theory of Carding and development of Carding Machinery.
The stationary Top Card.
The Roller and Clearer Card.
The revolving Top Card.
Card Grinding, Setting, Stripping, and care of Cards.
2. Practical work on machines named in above lectures timed to
correspond with lecture course.

3. Lessons on calculations in connection with the machines named above.

Second Year :

1. Course of Lectures on the following subjects :

Construction and use of the Railway Head.

Principle of Drawing processes.

Construction and care of the Drawing Frame.

Construction and use of the Cotton Comb.

The construction and use of the Sliver Lap Machine.

The construction and use of the Ribbon Lap Machine.

The operation and care of Combing Machinery.

The development of the Fly Frame.

The construction and use of the Slubbing Frame.

The construction and use of the Intermediate Frame.

The construction and use of the Fine Frame.

The operation and care of Flier Frames.

The construction and use of the Ring Spinning Frame.

The management and operation of Spinning Rooms.

The construction and use of the Spinning Mule.

The construction and use of machinery for the purpose of making ply yarns, including Spoolers and Twistors.

2. Practical work on machines named in the above lectures timed to correspond with the lecture course.

3. Lessons on calculations connected with the above machines.

Third Year :

1. Course of Lectures on :

List of Machines adapted for different purposes in Cotton Mill Work.

- Layout of machinery for different processes.
- Mill engineering.
- Mill buildings, different styles of construction.
- Power for Cotton Mills, steam or water.
- Transmission of power by belting, ropes, gearing or electricity.
- Humidifying and Humidifiers.
- Fire protection, inside and outside—different systems.
- Cost of mill machinery.
- Mill statistics.
- Cost of operation, and so on.
- Special plants of Spinning Machinery for making yarn from waste, carpet yarns, imitation of woolen yarns, fancy yarns, blends of cotton and wool, and so on.
- 2. General research and experimental work and preparation of thesis.



Wool Department.

WOOL AND WORSTED CARDING, COMBING AND SPINNING.

PRINCIPAL, PROF. FENWICK UMPLEBY.

First Year :

1. Lecture Course.

Animal and vegetable fibres.

Wool Sorting.

Manufacture of Shoddies and Mungoes.

Wool Washing and Carbonizing, including the construction and uses of the Washing Machine and hydro-extractors.

Picking and Mixing.

Construction and uses of the several kinds of Pickers, Burring and Garnetting Machines.

Mixing and Blendings of Lots.

Carding, first and second Breakers, Condensers.

The setting of Workers, Strippers, Fancies, Doffers, etc.

The various kinds of Feeds,—Bramwell, Blamires and the Torrence Balling Machine.

Spinning and Twisting.

(The above lectures include all necessary calculations.)

2. Practical Demonstrations on the several machines, including the construction of each machine, the count of the cards for the various machines for different qualities and kinds of material.

Second Year :

1. Lecture Course.

The differences between a worsted and woolen thread.

Carding.

Back washing and gilling, the nature of these processes.

Construction of the Drawing and Roving Frames.

Construction of the Spinning Frame.

Spinning on Mule, Flyer and Ring Machines.

Construction of the Doubling and Twisting Frame.

Hanking, Bundling and Balling.

Yarn testing, etc.

(The above lectures include all necessary calculations.)

2. Practical work on above machines.

Third Year :

Manufacture of fancy yarns.

Fancy mixed yarns.

Woolen and cotton.

Woolen and silk.

Woolen and worsted.

Two, three and more, ply fancy twists.

Fancy knotted yarns.

Loop, slub and mottled yarns.

Color as applied to fancy yarns.

Lay out of machinery for the different processes.

Mill engineering.

Mill buildings, different styles of construction.

Transmission of power by belting, ropes and gearing.

Cost of operation, production, etc.

Design Department.

DESIGNING OF FABRICS DEPARTMENT.

PRINCIPAL, PROF. FENWICK UMPLEBY.

First Year :

1. Course of lectures on cloth construction and designing in Cotton, Woolen and Worsted. Subjects :

Classifications of fabrics.

Plain fabrics and fabrics on a plain cloth basis.

Names and explanation of different parts of cloth and terms applied to weaves, etc. Point or design paper.

Methods of representing weaves, drafts, etc., on paper.

Explanation of harness and chain drafts.

Twill cloth and combinations of same.

Broken twills.

Sateens.

Combination of weaves.

Figured weaving on plain ground.

Diapers, toweling, velveteens, coatings, trouserings, and goods made on lappet looms.

Colored goods, stripes.

Checked goods.

2. Practical work and teaching on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc., on paper, including yarn and cloth calculations as below.

3. Practical work on hand looms, putting into operation the principles taught in the foregoing course.

Yarn and cloth calculations.

4. The uses of textile calculations, methods of naming or counting cotton, worsted and linen.

Methods of naming woolen yarns.

Methods of naming silk yarns.

Comparative calculations for converting one system into that of another

Calculations for folded or ply yarns.

Calculations to find weight, count or length of warp, from given data.

Calculations for reeds.

Calculations for harness, straight, centred, or pointed draft.

Calculations for harness, spaced and in combinations.

Calculations for shrinkage, or contraction.

Calculations for the quantities of material required to make plain and striped warps.

Calculations for the quantities of filling required to make plain and checked fabrics.

Calculations to find the number of ends per inch in order to use a given weight of warp, also picks per inch to use a given weight of filling.

Calculations on the proportioning of fabrics.

Second Year :

1. Course of lectures on Textile Designing as applied to :—

Cloth made with, or ornamented by, extra warp.

Cloth made with, or ornamented by, extra filling.

Double cloths.

Fancy woolen cassimeres.
Trouserings, suitings and coatings.
Figured matelasses.
Worsted and mohair mantle cloths.
Carriage robes.
Figured blankets.
Shawls.
Figured twill cloths.
Figured double plain cloths.
Design or point paper.
Colored design to indicate the woven fabric.

2. Practical work on and teaching cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc., on paper, including yarn and cloth calculations.

3. Practical work on hand looms, putting into operation the principles taught in the foregoing course.

4. Calculations. The amount of material required for laying out lots for double and twist yarns, two, three or more ply yarns.

Ascertaining the cost of double and twist yarns, composed of different qualities of yarns.

Cost and amount of materials used in the construction of fabrics :
Cotton dress goods, gingham and fancy dress goods.

Fancy cassimeres.

Worsted suitings.

Tricots.

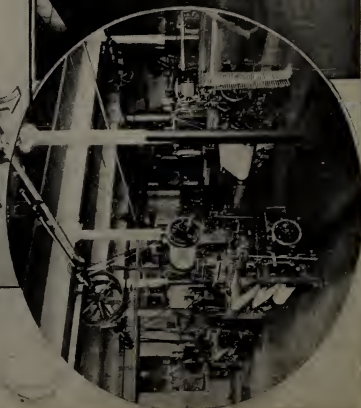
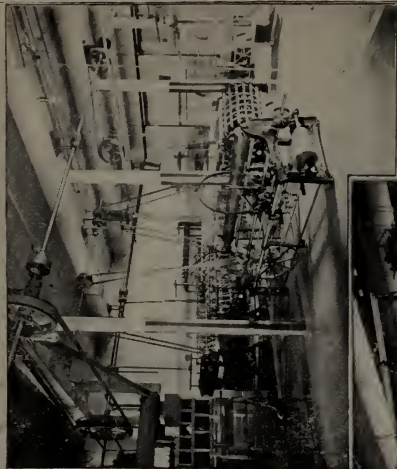
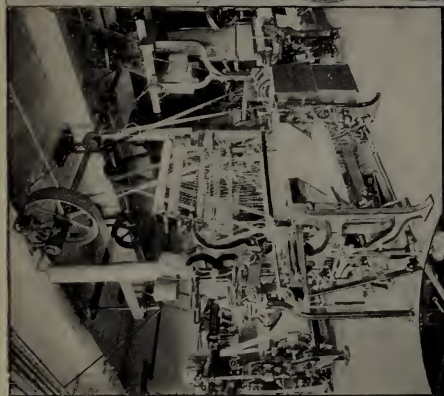
Overcoatings.

Double cloths.

Ingrain carpets with cotton chain.

Ingrain carpets with worsted chain.

VIEWS IN WEAVE ROOM.

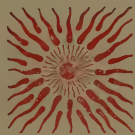


Third Year :

Designs in Gauze, Leno and Lappet work.

Carpets, figured cloths, damasks, curtains, table cloths, etc.

In the third year students who desire to study any particular branch of textile designing in which they may be engaged or may wish to follow will have the privilege of making experiments in the hand loom weave room, under the direction of the principal.



Weaving Department.

POWER LOOM WEAVING DEPARTMENT.

PRINCIPAL OF DEPARTMENT, MR. WM. NELSON.

First Year:

1. Course of lectures on Weaving Machinery and Processes, as used for Cotton, Woolen and Worsted, including Warp Preparation.

Subjects:

Varieties and forms of yarn as used for weaving.

The construction and use of Spooling Machinery for wool and cotton.

The construction and use of Warpers of various kinds.

The woolen Warping and Sizing Machine.

The Slasher, its construction and use.

The Woolen Beamer.

Sizing materials and size mixing machinery.

Long and short chain systems of preparing warps and filling.

Other systems of preparing warps for special purposes.

Drawing-in and twisting.

2. Practical work on machines named above. Drawing in warps and warp preparation in cotton, woolen and worsted, timed to correspond with the respective lectures.

3. Lessons on calculations applied to the machines and processes named above.

Second Year:

1. Course of lectures on weaving mechanism, as under:
The plain power loom and its construction.
Shedding by tappets.
Various picking motions.
Fast and loose reeds.
Take up and let off motions.
Minor adjustments of the power loom.
Plain looms as altered for weaving fancy cloth.
Looms constructed for several shuttles.
Drop box motions.
Circular box motions.
Shedding motions.
Negative and positive cam shedding motions.
Single acting dobbies.
Double acting dobbies.
Spring boxes and other motions for returning harness.
Chain building for dobbies.
Chain building for box looms.
Laying out cams.
Lappet motions.
Towel and other pile cloth weaving.
Open and close shed looms.
2. Practical work on the above looms, including teaching the student to weave and fix looms.
Also pulling down looms and rebuilding same, including timing, setting, and fixing one part in relation to another.
This work will be arranged to correspond with the respective lectures.

3. Lessons on calculations applied to the machines and processes named above.

Third Year :

1. Lectures on jacquard machinery.

Single lift jacquards.

Double lift jacquards.

Jacquards specially arranged for such work as ingrain carpet work.

Gauze or leno weaving, tapestry weaving, quilt weaving and so on.

Weave room, engineering and equipment.

Cost of weave mill operation and statistics of operation.

The humidifying, lighting and fire protecting of weave mills.

Knotting and burling.

Fulling, construction of the several kinds of fulling machines.

Gigging, construction of the gig.

Shearing, construction of the shear.

Pressing, construction of the several kinds of presses.

Measuring and weighing, ticketing, numbering and rolling.

Cloth folders.

Cloth brushers.

Baling and casing of cloth for shipment.

2. General experimental and thesis work, to be conducted by arrangement with the head of the department and under his supervision.

Chemistry and Dyeing Department.

CHEMISTRY AND DYEING DEPARTMENT.

PRINCIPAL, PROF. LOUIS A. OLNEY, A. C.

Study has been arranged covering the subjects of :

Chemical and microscopical study of various fibres.

The use of natural coloring matters and of artificial coloring matters in dyeing.

Water, and methods of testing same, and detection of impurities.

Bleaching.

Scouring.

Mordants, their preparation, use and application.

The testing of dye-stuffs, and other branches of industrial chemistry, having special reference to bleaching, dyeing, printing and finishing of cotton, wool, silk and linen fabrics.

For further particulars see page 64.

Art Department.

DECORATIVE ART DEPARTMENT.

PRINCIPAL, PROF. VESPER L. GEORGE.

Courses will be arranged so that in the first year students may take free-hand drawing as a preparation for the designing course, and more advanced classes will be arranged for those who intend following the occupation of a designer.

If sufficient encouragement is given by residents of Lowell and vicinity, the same instructor will conduct art classes for those who are not regular students of the School, but are wishful of receiving instruction in art at specified hours during the week, preferably in the afternoon.

The Director will be glad to have the addresses of any ladies who are interested in this branch of study, and who would attend the classes in case of their being formed. An art class could probably be formed to meet twice a week for two hours each time.

Also see page 68.

Mechanics.

DEPARTMENT OF MECHANICS.

PRINCIPAL, PROF. W. W. CROSBY.

First Year :

Course of lectures on definition of parts of machines.

Force, work, and the measurement of same.

Levers.

Wheel and Axle.

Pulley Blocks.

Inclined Plane and Wedge.

The Screw and its applications.

Toothed Gearing.

Pulleys and Belting.

Lessons on Calculations.

Definition of measurements of pulleys and gearing.

Calculations of speed of shafts, pulleys, belts and gearing.

Alterations of speeds and sizes of pulleys and gears.

2. Machine Drawing.

Second Year :

1. Advanced Course in Applied and Theoretical Mechanics.

2. Advanced Course in Machine Drawing.





HAND LOOM ROOM.

Evening Classes.

The plan of evening instruction includes all the subjects taught in the day classes, with several additional ones, but as the time at the disposal of those who work in the mill is limited, there is no necessity or even possibility of taking all the subjects in one session. Certain grouping of subjects have been arranged, and it is strongly recommended that those who have the time to devote take up one group. It is possible in some cases to take two groups, such as Spinning and Weaving, or Weaving and Dyeing, or other combinations. This is not recommended unless the student has considerable time to devote to study out of school.

It is also possible to take a 1st year and a 2nd year course in one year in the Cotton Course, thus covering the whole course. This can be done also in the Weaving Course, and in the Woolen and Worsted Course. This arrangement is made for the benefit of those whose stay in Lowell is limited to one winter, but is not recommended unless the student has four evenings per week to devote to work in the school and an additional amount of spare time to devote to study out of school. The fees in a case of taking two courses in one are of course doubled.

The fees charged for each group, although including instruction in every respect similar to the day school, are arranged so low in most cases as to merely cover the cost of the materials used. The fees for the whole year are twice the amount named below.

Where several evenings are named for practical work in one subject the student will be present on one evening only, and is requested to state on his application blank which evening he prefers.

Cotton Spinning.

Course of lectures on Cotton Fibre, Picking, Carding, Combing and Spinning. For list of subjects see page 41.

Hours, First Year Students: Lectures seven to eight o'clock, and eight to nine o'clock. Tuesday evenings.

Hours, Second Year Students: Seven to eight o'clock, and eight to nine o'clock. Friday evenings.

Practical work Monday, Tuesday, Thursday or Friday evenings, one evening only to each student.

Fee for this subject, \$2.50 per term.

Woolen Spinning.

Course of lectures on Wool and Worsted Spinning, including calculations and practical work. For subjects of lectures see page 44.

Hours, Lectures, First Year Students: Tuesday evening. Seven to eight o'clock, and eight to nine o'clock.

Hours, Lectures, Second Year Students: Friday evenings, seven to eight o'clock, and eight to nine o'clock.

Practical work Monday, Tuesday, Thursday or Friday evenings.

Fee for this subject, \$2.50 per term.

Warp Preparation and Weaving.

Course of lectures on Warp Preparation and Weaving Machinery, as used for Cotton, Woolen and Worsted, also calculations and practical work. For subjects of lectures see page 50.

Hours, First Year Students: Lectures seven to eight o'clock, and eight to nine o'clock. Thursday evenings.

Hours, Second Year Students: Lectures seven to eight o'clock, and eight to nine o'clock. Tuesday evenings.

Hours, practical work, Monday, Tuesday, Thursday or Friday evenings.

Fee for this group of subjects, \$2.50 per term.

Designing.

Course of lectures on Cloth Construction, Textile Calculations, and color as applied to Textiles, including practical work on cloth analysis.

Hours, Lectures, First Year Students: Seven to eight o'clock, and eight to nine o'clock. Monday evenings.

Hours, Cloth Dissection: Seven to nine o'clock. Friday evenings.

Hours, Lectures, Second Year Students: Seven to eight o'clock, and eight to nine o'clock. Thursday evenings.

Hours, Cloth Dissection: Seven to nine o'clock. Tuesday evenings.

For subjects of lectures, see page 46.

Fee for this subject, \$5.00 per term.

Chemistry and Dyeing.

Lessons on Elementary Chemistry, including practical work.

Hours, First Year Students: Monday evenings. Seven to nine o'clock.

Fee for this subject, \$2.50 per term.

Full Course Dyeing and Textile Chemistry, including lectures on practical work. Tuesday, Thursday and Friday evenings from seven to nine o'clock.

This will be a first year course only.

Fee for this subject, \$5.00.

Women's
Department.

Classes in Textile Designing are held Monday afternoons from 2.30 to 4.30 p. m., and Friday afternoons 2.30 to 4.30 p. m.

Fee, \$5.00 per term.

Free hand and other drawing classes will be arranged as named on page 54.



Free Popular
Lectures.

A course of free popular lectures has been arranged for, and these will be delivered in the hall of the School at intervals of about three weeks.

Among the lectures already arranged for are the following :—

OPENING ADDRESS :

October 4, Mr. C. J. H. Woodbury, A.M.,
Sec'y N. E. Cotton Mfrs. Ass'n.

LECTURES BY

October 26, Mr. Frederick T. Walsh, Lowell, Mass.,
Agent of the Lowell Bleachery, Lowell.
On the Bleaching of Textiles.

November 12, Mr. W. G. Nichols, Clinton, Mass.,
Superintendent of the Lancaster Mills, Clinton,
On the Manufacture of Gingham.

November 30, Mr. V. I. Cumnock, Lowell, Mass.,
Superintendent of the Boott Mills, Lowell.
On Textile Designing.

December 16, Prof. C. P. Brooks, Lowell, Mass.,
Director of the School,
On Cotton Cultivation.

1898.

- January 6, Mr. W. P. Atwood, Lowell, Mass.,
Of the Hamllton Manufacturing Co., Lowell, Mass.,
On Dyeing of Textiles.
- January 24, Mr. Walter E. Parker,
Agent Pacific Mills, Lawrence.
- February 11, Mr. C. H. Hutchins, Worcester, Mass.,
President Crompton-Knowles Loom Works, Worcester, Mass.,
On Weaving Machinery.
- February 28, Mr. Edward Atkinson, Boston, Mass.,
President Boston Manufacturers Mutual Fire Insurance Co.
- March 25, Hon. N. P. Frye, North Andover, Mass.,
On Woolen Machinery.
- April 8, Mr. J. J. Hart, Lowell, Mass.,
Superintendent Merrimack Print Works, Lowell, Mass.,
On Some Modern Developments of Calico Printing.
- April 21, Mr. F. A. Flather, Lowell, Mass.,
Of the Lowell Machine Shop,
On the Cotton Card.
- May 10, Mr. D. M. Thompson, Providence, R.I.,
President and Treasurer of the Corliss Steam Engine Co.,
On the Corliss Engine.

L. T. S.
Special
Classes.

It is proposed to organize several other classes to take short courses of probably five to ten lectures referring to special subjects connected with textile industries. The fee for these will be \$1.00 for the course, and the subjects to be treated will be selected from the following :—

Woolen and worsted cloth finishing.

Hosiery manufacture.

Steam and water power and transmission of power.

Mill construction and engineering.

Linen manufacture.

Spinning of fancy yarns.

Machine embroidery.

If these can be arranged, due notice will be given by announcement in the local and textile papers.

The Director will be glad to receive names of persons who would be willing to attend any one or more of the above special classes in the evening.

Course of Study In the Chemistry and Dyeing Department.

PRINCIPAL, LOUIS A. OLNEY, A.C.

The general course of study in this department will extend over three years.

The first year will be devoted to Elementary Chemistry, Stoichiometry, and Qualitative Analysis.

The second year will be given entirely to Dyeing and Textile Chemistry.

The third year will consist of advanced work in such lines of Chemistry as will be of advantage to the textile chemist.

The main course in dyeing and textile chemistry is placed in the second year so as to give the students who are not able to attend three years an opportunity to acquaint themselves with dyeing and textile chemistry in two years.

The School will give thorough and exhaustive education in textile chemistry and dyeing. The studies will be taken up from both a theoretical and practical point of view, and a large amount of work will be required in the chemical laboratory, which is fitted with a complete set of necessary apparatus and chemicals.

It is not only advisable but necessary that a student should have a thorough knowledge of general chemistry before taking up the subject of textile chemistry.

Consequently no student will be allowed to take the third year of this course who has not taken the first and second, or the second year who has not taken the first year, unless he or she can successfully pass a prescribed examination or present a satisfactory certificate for the previous work, except as provided in catalogue in connection with the cotton, wool, or designing courses.

First Year :

GENERAL CHEMISTRY.

1. Elementary Chemistry: Lectures, Recitations, Laboratory Work.

Chemical philosophy: Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-metallic elements: Study of their occurrence, properties, preparation, compounds, etc.

Metallic elements: Study of their occurrence, properties, preparation, compounds, etc.

Carbon compounds: Study of their occurrence, properties, preparation, etc.

*2. Complete qualitative analysis.

*3. Stoichiometry. Chemical problems, reactions, etc.

Second Year :

TEXTILE CHEMISTRY AND DYEING. .

1. Technology of vegetable fibres: Chemical and physical properties, chemical composition, microscopical study, actions of chemicals, heat, acids and alkalies, etc.

*These studies will come in the second term for students in the regular course in chemistry and dyeing.

2. Technology of animal fibres: Chemical and physical properties, chemical composition, microscopical study, action of chemicals, heat, acids and alkalies, etc.

3. Operations preliminary to dyeing: Cotton bleaching, bleaching of linen, wool scouring and bleaching, silk scouring and bleaching.

4. Water and its application in the textile art: Analysis, impurities, purification.

5. Mordants: Theory of mordants, chemical properties, their application, aluminum mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannic acid and sulphated oil, etc.

Application of dyestuffs to vegetable fibres.

6. Theory of dyeing: Chemical, mechanical, theory of solution, etc.

7. Natural coloring matters: Indigo, logwood, Brazil wood, cochineal, fustic, turmeric, catechu, etc.

8. Artificial coloring matters: Preparation and application, direct cotton colors, basic colors, acid colors, the eosins and rhodamines, alizarin colors, aniline black, insoluble azo colors developed on the fibre, etc., etc.

9. Machinery used in dyeing, including mechanical processes, printing, etc.

10. Dye testing, etc., etc.

Third Year:

ADVANCED CHEMISTRY.

1. Quantitative analysis: Analysis of soap, acids, alkalies, water, bleaching powder, lime, etc., etc.

2. Industrial chemistry: Branches of chemistry pertaining to textile industry, including chemistry of soap, building material, oil, etc.

3. Advanced work in dyeing.
4. Detection of dye on fibre.
5. General research and thesis work.

EVENING COURSES IN CHEMISTRY AND DYEING.

There will be two evening courses in this department, each running through two terms, or the entire school year.

COURSE I.

Tuesday and Thursday evenings, from seven to nine o'clock. This course will be the same as first term of first year for day students. It will include lectures, recitations and laboratory work.

COURSE II.

Monday and Friday evenings, from seven to nine o'clock. This course will be the same as the second year for day students.

The fees for the day courses in this department are the same as for other departments, namely, \$50.00 per term. The fees for the evening courses are \$5.00 per term.

A deposit must be made by the student at the beginning of the term; this deposit to be returned to him at the close of the term, subject to such deduction as will reimburse the School for chemicals used, and broken or damaged articles. This, with moderate care, should not exceed \$15.00 per term.

The above arrangements are subject to modification.

Decorative Art Department.

The close relation Decorative Art bears to the textile industry requires the organization of a Decorative Art Department.

While it is the special object of the school to give instruction in this department of such a character as to develop a knowledge of the laws of decoration and theory of design as applied to textile fabrics of every kind, it is a fact that the fundamental instruction necessary for this is similar to that required for other branches of decorative art, so that students not necessarily intending to follow textile manufacturing are invited and may attend with advantage.

Special arrangements have been made to form classes in freehand drawing and decoration, for the purpose of giving the students general instruction in the theory and practice of decorative art, the instruction afterwards to be devoted to the special branch the student desires to follow. The school will thus fulfill the object of preparing the student in practical designing in any of the branches of decorative art, with special regard to fabrics.

The Art Department will be opened on Wednesday, September 22, 1897, at 7.30 p.m., with a lecture by C. Howard Walker, Esq., of Boston, on :

DECORATION.

Day Course.

Class 1. Instruction and training of hand and eye in Free-hand and Geometrical Drawing. Tuesday mornings. Hours from 10 a.m. to 1 p.m.

Class 2. Advanced instruction and practice in Freehand and Geometrical Drawing. Thursday mornings. Hours from 10 a.m. to 1 p.m.

Class 3. Instruction in line, form, color and tone, based on historic ornament. Tuesday afternoons. Hours from 2 p.m. to 4 p.m.

Class 4. The application of natural (conventionalized) forms,—plants, etc.,—according to the laws that have been evidenced by the study of historic ornament, with special reference to textile design. Thursday afternoons. Hours from 2 p.m. to 4 p.m.

These studies are preparatory and essential to excellence in sketching for jacquard fabrics, damasks, ingrain, brussels and other carpets, grenadines, bed spreads, table cloths, etc., and general applied textile design, and equally so to any other branch of Decorative Art.

The fee for the day course will be \$10.00 per term.

Additional Classes.

If there is sufficient demand, there will be additional classes established in other departments of Decorative Art, when this can be done without interfering with the regular school course.

Those desiring such instruction are invited to correspond with the Director with a view to the formation of any such special classes.

Public Art Lectures.

Mr. Vesper L. George will give afternoon or evening lectures on Art subjects from time to time, which will be illustrated by examples of fabrics and by the stereopticon, and which will be announced in the local papers.

Evening Course.

A class will be held on Tuesday evenings from 7.00 to 9.00, leading up to the subject of textile decoration. As far as possible, the studies will follow the day course previously indicated.

Each student will be encouraged to make individual progress as fast as possible.

The fee for this class will be \$2.50 per term. It is strongly recommended that the second year students in the evening designing department of the school also attend this class.

General.

The fees in all cases are payable in advance, and no student will be allowed to enter the class until he has paid his fees and obtained a card of admission.

Each student is required to fill out an application blank, which may be had on request. The Principal of the Art Department will determine whether students shall enter the elementary or advanced free-hand classes, and for this purpose will attend the school on September 30, from 2.00 to 5.00 in the afternoon and 7.00 to 9.00 in the evening, to interview the students and to inform each student to which class he will be assigned.

The materials to be purchased will probably cost \$10.00 and upwards, unless the student already possesses drawing instruments, paint boxes, brushes, etc., in which case the amount will be considerably reduced.

For other information, not included in this catalogue, address,

C. P. BROOKS, DIRECTOR.

REGISTER OF STUDENTS, 1897-98.

DIPLOMA STUDENTS.

JUNIOR CLASS, (1899.)

Cotton Manufacturing Course.

NAME.	HOME ADDRESS.	LOWELL ADDRESS.
Bailey, J. W. ✓	Waltham. }	100 Westford St.
Bissell, W. E.	Lowell.	117 Third St.
Carter, E. E.	Lowell.	Cor. Princeton and Chester Sts.
Harmon, C. F.	Lowell.	250 High St.
Marshall, G. A.	Fitchburg.	256 Appleton St.
Smith, A. A.	Lowell.	878 Chelmsford St.

Woolen Manufacturing Course.

Cottle, J. H. ✓	Lowell.	209 Westford St.
Fels, A. B. ✓	Lowell.	989 Lakeview Ave.
Gilman, G. W. ✓	Lowell.	23 Hurd St.
Tilton, E. T. ✓	Lowell.	23 So. Walker St.

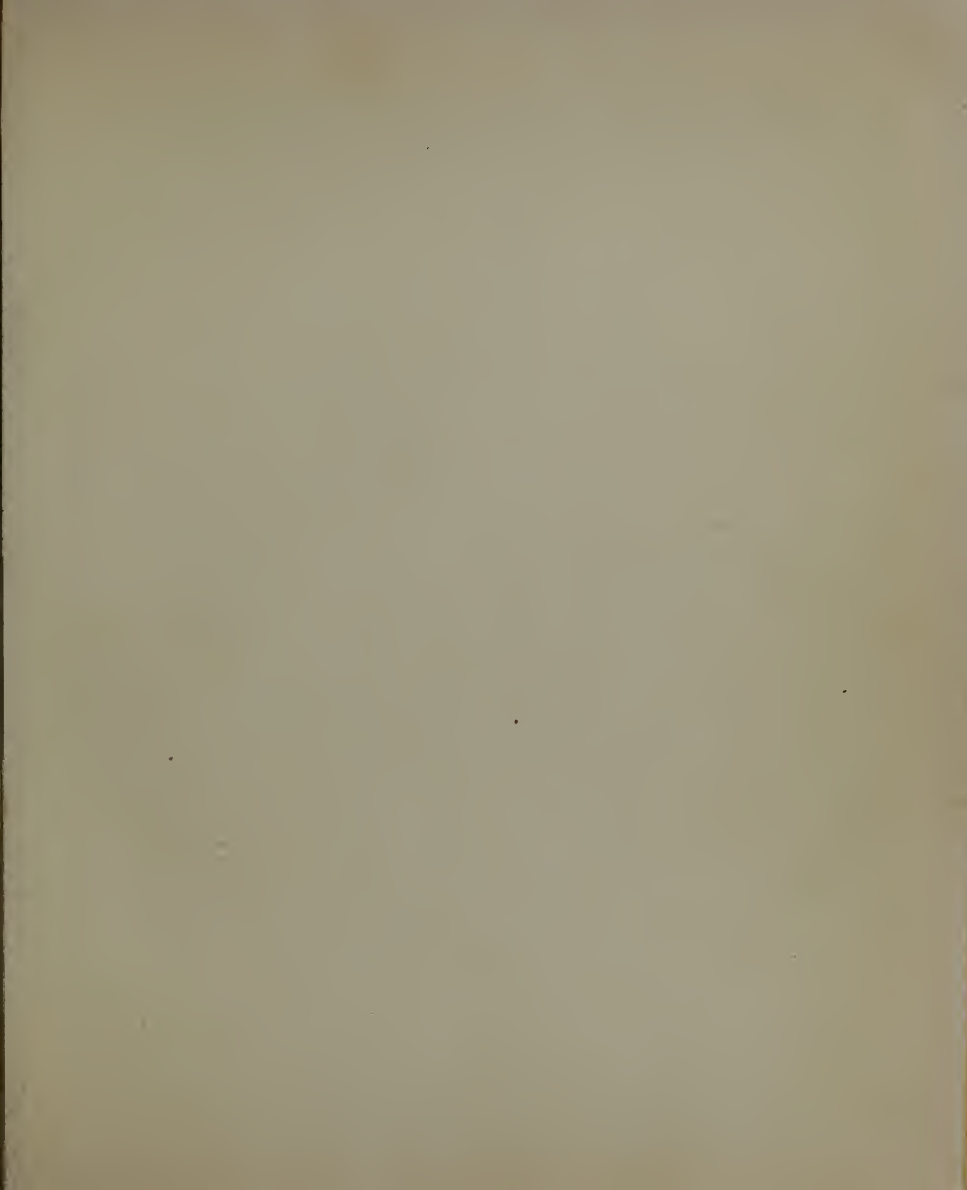
Designing Course.

Fitts, J. A. ✓	Rochdale.	727 Bridge St.
Gerrish, Walter ✓	Lowell.	31 Arlington St.
Moss, C. P. ✓	Manchester, N. H.	27 Central St.

FRESHMEN'S CLASS, (1900.)

Cotton Manufacturing Course.

NAME.	HOME ADDRESS.	LOWELL ADDRESS.
Atkins, L. A.	Lynn.	322 E. Merrimack St.
Baker, J. G.	Plainville, Conn.	318 Central St.
Bolger, J. C.	Fall River, Mass.	204 Moody St.
Barr, I. W.	Lowell.	53 Beech St.
Cole, W. B.	Rockingham, N. C.	264 Appleton St.
Dadmun, W. R.	Worcester, Mass.	322 E. Merrimack St.
Fiske, S. G.	Hingham, Mass.	51 Bon Marche Bldg.
Guild, W. H.	Manchester, N. H.	
Hartshorn, L.	Greenville, N. H.	66-67 Bon Marche Bldg.
Lamson, G. F.	Lowell.	186 Tenth St.
Mann, A. M.	Jamaica Plain	3 Myrtle St.
McAlister, J. W.	Asheboro, N. C.	242 Appleton St.
Ramsdell, A. R.	Andover, Mass.	72-73 Bon Marche Bldg.
Reed, G. E.	Lowell.	11 Nesmith St.
Soderberg, C. E.	Chelmsford.	
Spain, J. W.	Quitucan, Ga.	322 E. Merrimack St.
Stewart, S.	Lewiston, Me.	264 Appleton St.
Smith, S. E.	Methuen.	Box 276 Lawrence.
Stimpson, R. W.	Lowell.	207 Appleton St.
Syme, J. F.	Worcester, Mass.	4 Park St.
White, W. D.	Worcester, Mass.	280 E. Merrimack St.





Woolen Manufacturing Course.

NAME.	HOME ADDRESS.	LOWELL ADDRESS.
Brickett, C. J.	Haverhill.	17 First St.
Bodwell, H. R.	Andover.	72-73 Bon Marche Bldg.
Hays, B.	No. Andover.	79 Appleton St.
Leach, H. K.	Gilbertville.	727 Bridge St.
Levey, G.	Ludlow, Vt.	141 Summer St.
Pearce, F. H.	W. Fitchburg.	
Stitt, H. I.	Youngstown, Ohio.	305 Summer St.
Stewart, A.	Beauharnois, Canada.	79 Appleton St.

Designing Course.

Adams, L. T.	Lowell.	24 June St.
Hanley, C. F.	Worcester, Mass.	31 Jackson St.
Perkins, J. E.	Pittsfield, Mass.	5 Upland St., Dracut.
Pradel, A. J.	Collinsville.	Collinsville, Mass.
Trull, J. C.	No. Tewksbury.	No. Tewksbury, Mass.
Wing, C. T.	Lowell.	566 Westford St.

Dyeing Course.

Pohlman, G. C.	Fitchburg.	240 Thorndike St.
Sleeper, R. R.	Lowell.	112 Charles St.
Thompson, H. J.	Lawrence.	28 Bodwell St.

Decorative Art Course and Women's Department of Textile Design.

NAME,	HOME ADDRESS.	LOWELL ADDRESS.
Burchard, V., Miss	Lowell.	39 Talbot St.
Burrage, K., Miss	Lowell.	80 Gorham St.
Campbell, L. E., Miss	Lowell.	266 Worthen St.
Chase, E. D.,	Lowell.	19 Lincoln St.
Dalton, G. G., Miss	Salem.	190 Lafayette St.
Goodhue, A. H., Miss	Dracut.	Kenwood, Dracut.
Hines, N. P., Miss	Lowell.	1066 Middlesex St.
Lyon, G. A.,	Boston.	Boston.
Merchant, E. C., Miss	Lowell.	268 Westford St.
Towle, J., Miss	Lowell.	104 Westford St.
Woodies, I. A., Miss	Lowell.	74 Gates St.

Irregular Courses.

Bean, J. W.	Lewiston, Me.	280 E. Merrimack St.
Colony, H. W.	Keene, N. H.	
Draper, S. P.	Boston.	23 Dodge St.
Hastings, W. M.	West Newton, Mass.	20 Willow St.
Hooker, S. A.	Cincinnati, O.	Cor. Sherman and Hanks Sts.
Reed, G. E.	Lowell.	11 Nesmith St.
Wainwright, C. W.	Stonewall, Miss.	322 E. Merrimack St.

AFTERNOON COTTON SPINNING CLASS.

Abbott, A. L.
Crooker, W. E.
Crysler, H. S.
Colby, A. D.
Daner, C. W.
Dopp, J. W.
Foster, C. A.
Flather, F. A.
Fenderson, G. F.
Hall, W. H.
Humphrey, O. L.

Kelly, A. J.
Landers, W. H.
McLean, D. G.
Mackay, R. N.
Mitchell, A. C.
Rowell, H. C.
Saunders, F. W.
Searle, J.
Silcox, A. E.
Thayer, W. B.
Wright, W. G.

EVENING COTTON SPINNING CLASS.

First Year :

Abbott, P. E.
Billings, V. W.
Cullinan, M. H.
Duncklee, H. S.
Greer, A. H.
Hatch, A. L.
Hooker, S. A.
Harris, —
Hamilton, C.
Kelly, A. J.
Kitchen, A. B.
Mackay, R. N.

Second Year :

Benner, E. W.
Broadbent, J. T.
Brown, F. P.
Donnelly, J.
Farrell, P. F.
Hart, F. H.
Holgate, T.
Knowlton, W. B.
Lyon, G. A.
Reynolds, P. L.
Sidebottom, J. W.
Swift, E. S.

Morgan, W.
Osgood, C. F.
Peacock, J. R.
Perham, R. H.
Richards, P. E.
Reynolds, P. L.
Rooney, G. W.
Seddon, N. G.
Shaw, F. P.
Shields, A.

Tillson, H. E.
Young, C. F.

EVENING WOOLEN SPINNING CLASS.

Burkhardt, W.
Broadbent, C. J.
Baker, J. G.
Binns, H.
Campden, R.
Campden, F. T.
Crompton, H. H.
Campbell, A. D.
Campbell, J. J.
Coburn, W. S.
Dickinson, T.
Edgell, W. B.
Ellis, H. E.
Gaudlitz, P.
Hamer, W.
Hart, G. H.
Harding, Frank
Hill, E. F.

Holgate, C. H.
Holgate, T.
Johnson, B.
Kellett, I.
Lyon, G. A.
Margerison, J. D.
Norton, J. J.
Nugent, T. A.
Peel, H.
Robinson, E.
Smith, W. H.
Small, D. F.
Stevenson, Wm.
Stopherd, W. H.
Trow, R. W.
Tetley, J.
Whitworth, E.
Whitworth, J. W.

EVENING WARP PREPARATION AND WEAVING CLASS.

First Year:

Bevington, J. H.	Kitchen, A. B.
Crowell, E. E.	Lancaster, J.
Dane, Fred	Lathom, J.
Dover, G.	Marshall, J. A.
Edgell, W. B.	Ormerod, O.
Farley, G. A.	Ormerod, H.
Hutton, R.	Saunders, A. B.
Hutton, C.	Smith, B.
Hooker, S. A.	Wood, J.
Kelley, A. J.	

EVENING WEAVING AND FIXING CLASS.

Second Year:

Brooks, N.	McDavitt, W. L.
Binns, H.	Midgeley, C.
Campbell, G. M.	Needham, J. W.
Collins, W. H.	Noble, J. T.
Childs, C. N.	Nugent, T. A.
Fitts, J. A.	Reenstierna, T.
Flather, F. A.	Smith, A. B.
Hanson, E.	Stopherd, W. H.
Hamblett, H. A.	Searle, J. E.
Hazling, H. F.	Swift, E. S.
Johnson, J.	White, W. D.
Murdy, W.	Young, C. F.

EVENING DESIGNING CLASS.

First Year :

Boardman, A.
Elston, F.
Haslam, J.
Lacey, W. H.
Pirotte, A. J.
Rodger, W. M.
Simonds, G. H.
Taylor, H.

Second Year :

Berry, F. M.
Collier, J.
Claus, E. F.
Day, A. B.
Frame, W.
Gaunt, A. C.
Gagan, J. H.
Howarth, J. L.
McArthur, W.
Moir, A. L.
Spedding, E. H.
Willman, A. E.
Willmott, W.
Wilton, G. H.

EVENING ART CLASS.

Blake, C. L.
Court, O. A.
Erskine, W. R.

Howarth, C. A.
Murkland, P. N.
Ramsdell, A. R.

EVENING DYEING CLASS.

Norris, K., Miss

McAlister, J. W.

EVENING CHEMISTRY CLASS.

Booth, J. W.	Knapton, B.
Barlow, J.	Knapton, S.
Barlow, R. H.	Livingston, H. R.
Bramhall, F. E.	Mungall, Andrew
Comber, J. H.	Newall, Harry A.
Cuttle, F. G.	Perry, G. H.
Friberg, E. G.	Potts, J. H.
Flather, F. A.	Robbins, F. F.
Geary, J. W.	Smith, J.
Homer, G. G.	Snow, F. L.
Kelly, J. F.	Umpleby, T. B.

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Canada	1
Georgia	1
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Mississippi	1
North Carolina	2
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Contributions or loans of machinery, apparatus or material, kindnesses extended or assistance rendered by the following firms or persons are acknowledged with thanks:—

- Altamus, W. W., Philadelphia, Pa.
- American Card Clothing Co., Lowell, Mass.
- American Drosophore Co., Boston, Mass.
- Appleton Co., Lowell, Mass.
- Arabol Mfg. Co., New York City.
- Arlington Mills, Lawrence, Mass.
- Atlas Mfg. Co., Newark, N. J.
- Atwood Machine Co., Stonington, Conn.
- Barbour Bros., Boston, Mass.
- Beach & Co., Hartford, Conn.
- Bennett, Frank P., Boston, Mass.
- Berry, A. Hun, Boston, Mass.
- Boott Mills, Lowell, Mass.
- Capron, C. C., Uxbridge, Mass.
- Garruthers, Robert, Lowell, Mass.
- Carey, W. W., Lowell, Mass.
- Clark, Jeremiah, Lowell, Mass.
- Coats, J. & P., Newark, N. J.
- Coburn, C. B. & Co., Lowell, Mass.
- Coburn Shuttle Co., Lowell, Mass.
- Crompton Loom Works, Worcester, Mass.
- Knowles Loom Works, Worcester, Mass.

Davis & Furber Machine Co., No. Andover Depot, Mass.
Draper Co., Hopedale, Mass.
Entwistle, T. C., Lowell, Mass.
Emmons Loom Harness Co., Lawrence, Mass.
Farbenfabriken of Elberfeld Co., New York, N. Y.
Firth, Wm., Boston, Mass.
Furbush Machine Co., Philadelphia, Pa.
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General Fire Extinguisher Co., Providence, R. I.
Gilbert Manufacturing Co., Gilbertville, Mass.
Gilbert Loom Co., Worcester, Mass.
Hamilton Mills, Lowell, Mass.
Harwood, G. S. & Son, Boston, Mass.
Howard Bros., Worcester, Mass.
Jacques Shuttle Co., Lowell, Mass.
Kalle & Co., New York, N. Y.
Kittredge, H. G., Boston, Mass.
Kitson Machine Co., Lowell, Mass.
Laminar Fibre Co., Cambridge, Mass.
Lawrence Manufacturing Co., Lowell, Mass.
Leominster Woolen Co., Leominster, Mass.
Lowell Mfg. Co., Lowell, Mass.
Lyon, A. S., Lowell, Mass.
Massachusetts Co., Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Merrimack Co., Lowell, Mass.
Mathieson, W. J. & Co., Boston, Mass.
Mauger & Avery, Boston, Mass.
Montgomery, J. R. Co., Windsor, Conn.

Nat. Assn. of Wool Mfrs., Boston, Mass.
N. E. Cotton Mfrs. Assn., Boston, Mass.
New York & Boston Dyewood Co., Boston, Mass.
Parker, W. H. & Sons, Lowell, Mass.
Pickhardt & Kuttroff, Boston, Mass.
Prince, Smith & Son, Keighley, Eng.
Read, Holliday & Co., Boston, Mass.
Roy, B. S., Worcester, Mass.
Sargent Sons, C. G., Graniteville, Mass.
Schoelkopp Aniline & Chemical Co., Buffalo, N. Y.
Star Worsted Co., Fitchburg, Mass.
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Union Shuttle Co., Lawrence, Mass.
United States Aerophor Air Moistening Co., Providence, R. I.
Wattles, L. R., Canton Junction, Mass.
Whitin Machine Works, Whitinsville, Mass.
Whiteley, John & Son, Halifax, Eng.
Williams Roving Carrier Co., Naugatuck, Conn.

Afternoon and Evening

STUDENTS ACCORDING TO OCCUPATION.

1 Apprentice.	1 Messenger.
1 Assistant Overseer.	1 Mule Spinner.
1 Assistant Superintendent.	7 Mill Operatives.
1 Beamer.	8 Not Known.
4 Book-keepers.	7 Overseers.
1 Calico Printer.	1 Pattern Cutter.
1 Carder.	1 Pin Setter.
1 Card Grinder.	1 Print Works.
14 Clerks.	1 Reed Finisher.
1 Cloth Stamper.	1 Roving Hand.
1 Cloth Inspector.	1 Roving Preparer.
2 Color Makers.	5 Second Hands.
1 Color Matcher.	10 Section Hands.
1 Cotton Waste Merchant.	2 Sketchmakers.
2 Designers.	2 Slasher Tenders.
8 Draughtsmen.	1 Spare Hand.
1 Drawing-fixer.	14 Spinners.
1 Drawer-in.	1 Store-keeper.
3 Drawing Carriers.	4 Students.
10 Dyers.	1 Superintendent.
1 Engraver.	4 Warp Dressers.
2 Finishers.	19 Weavers.
1 House-keeper.	1 Winder.
1 Learning Cotton Business.	2 Wool Combers.
6 Loom Fixers.	5 Wool Sorters.
18 Machinists.	1 Worsted Spinner.

DAY STUDENTS QUALIFICATION FOR ENTRY.

Graduates of Universities	2
Graduates of Schools of Technology	6
Graduates of High Schools	30
Graduates of Grammar Schools	13
Passed entrance examination or entered on evidence of proficiency	18
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Methods of naming silk yarns.

Comparative calculations for converting one system of yarns into that of another.

Calculations for folded or ply yarns.

Calculations to find weight, count or length of warp, from given data.

Calculations for reeds.

Calculations for harness, straight, centred, or pointed draft.

Calculations for harness, spaced and in combinations.

Calculations for shrinkage, or contraction.

Calculations for quantities of material to make plain and striped warps.

Calculations for the quantities of material required to make plain and checked fabrics.

Calculations to find the number of ends per inch in order to use a given weight of warp, also picks per inch to use a given weight of filling.

Calculations on the proportioning of fabrics.

Practical lessons in color effects.

Combinations of colored threads.

Color definition.

Color nomenclature.

Second Year.

Lecture Course:

Construction of Cloth.

Balance of Cloth.

Cloth made with or ornamented by extra warp.

Cloth made with or ornamented by extra filling.

Double and Triple Cloths.

Cotton, Fancy Sateen Stripes.

“ Gauze.

“ Leno.

“ Lappet.

“ Velvets.

Cotton Plushes.

“ Pile fabrics, cut and uncut.

Color and color effects.

Color definition.

Color nomenclature.

Fancy Woolen Cassimeres.

Trouserings, Suitings and Coatings.

Figured Matelasses.

Worsted and Mohair Mantle Cloths.

Figured Blankets.

Carriage Robes.

Shawls.

Figured double plain.

Reversibles.

Practical work and lessons on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, chains, etc., on paper, including all necessary calculations.

Amount of material required for laying out lots for mixes and twisted yarns.

Amount of material used in the construction of fabrics, analysis to consist of Cotton Dress Goods, Ginghams and Fancy Weave Dress Goods.

Fancy Woolen and Worsted Cassimeres.

Woolen and Worsted Suitings.

Woolen and Worsted Tricots.

Overcoatings.

Double Cloth and Ingrain Carpets.

Practical work on hand looms, putting into operation the principles taught in the foregoing course.

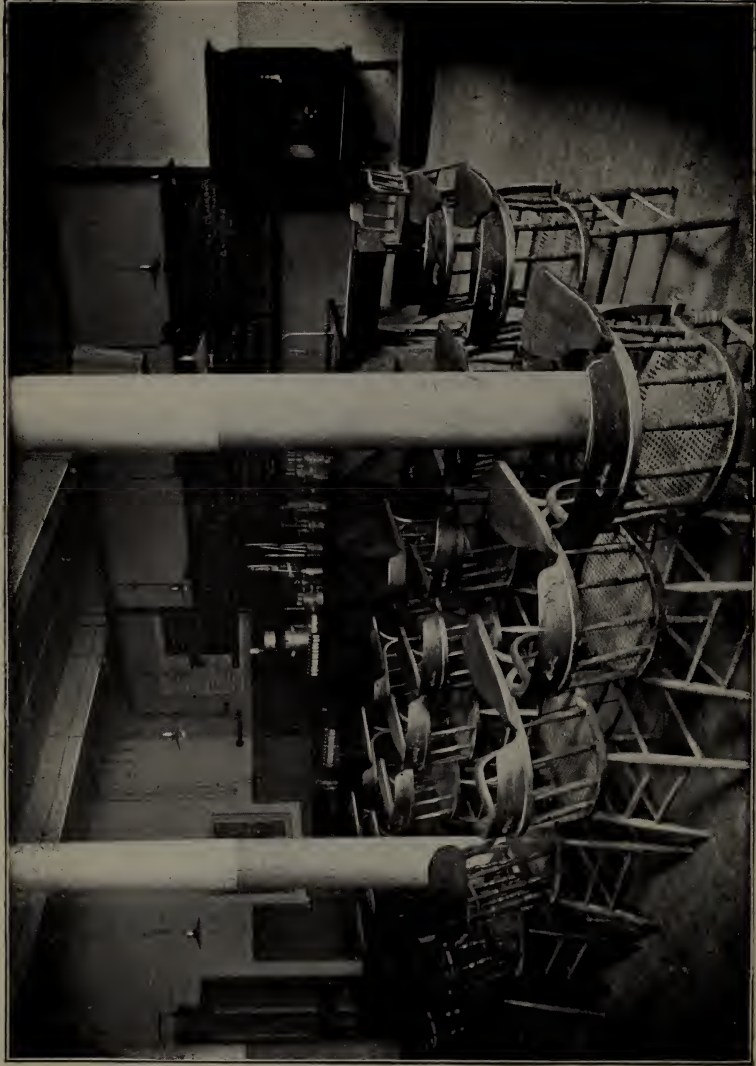
Third Year Course.

Lecture course:

Jacquard Designing.

Casting out.

Distribution of Patterns.



CHEMICAL LECTURE ROOM

Determination of areas occupied by the figures.

Jacquard figures formed with warp.

Jacquard figures formed with filling.

Figures not square.

The principles of designing, cloth structure and coloring best adapted to each of the above fabrics.

Cloth formed by the combination of Jacquard gauze and fancy harness weaves.

Jacquard pile and ordinary weaves.

Special designs for Jacquard gauze, and pile fabrics.

Vestings, quiltings, lappet, gauge and fancy pile fabrics.

Analysis.

The structure and analysis of all descriptions of compound fabrics viz.:—backed, double, and various types of Jacquard figured fabrics, specially applicable to the Cotton and Worsted industries.

Calculations necessary in determining the departmental and total cost of production of any fabric from given data of values of materials, labor, etc., by ascertaining the fibre, counts, threads, picks, weight, shrinkage, etc.

Hand and power loom practice, putting into operation the principles taught in the foregoing course.

FINISHING.

Processes of finishing:—such as perching, mending, burling, inspecting and numbering.

Scouring and Filling.

Wet and Dry Finishing.

Gigging, Wire Teazle Gigs and Wrappers.

Steaming, Shearing, Brushing, Napping.

Rotary and Hydraulic pressing.

Measuring and Rolling.

Process of Finishing Worsted Cassimeres, Cheviots, Beavers, Meltons, Chinchillas, Dress goods, etc.

Chemical Department.

General Chemistry is required of all students taking the regular course in Chemistry and Dyeing and all others intending to take up the study of Textile Chemistry and Dyeing later.

It will include lectures, recitations, and a large amount of individual laboratory work upon the following subjects, and will extend through one entire school year:—

Chemical Philosophy.—Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, Avorgadro's law, molecular weights, formulas, valence, periodic law, etc., etc.

Non-Metallic Elements.—Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements.—Study of their occurrence, properties metallurgy, chemical compounds, etc.

The Hydrocarbons and their Derivatives.—Study of their occurrence, properties, preparation, uses, etc.

Qualitative Analysis.—Before the completion of the course, the students will take up, as thoroughly as the time will permit, the qualitative detection of the more common metals and non-metals, with practical work.

No pains will be spared in giving the student a thorough training in fundamental principles of the science.

The course will consist of sixty hours of lectures and recitations, and one hundred and twenty hours of laboratory work, but those taking Course IV will take more than double this amount of work.

QUALITATIVE ANALYSIS.

Qualitative analysis will be studied by the students taking the regular Chemistry and Dyeing course during the second term of the first year.

The subject is taught in a thorough manner, and in addition to lectures and recitations, at least fifteen hours per week of laboratory work

LOWELL TEXTILE SCHOOL

LOWELL, MASS.

Annual Catalogue *1898-99*

Parker Block, Middle and Merrimack Streets.

PRINCIPAL ENTRANCE:

No. 128 Merrimack Street.

COURIER-CITIZEN PRINT,
LOWELL, MASS.

Trustees of the Lowell Textile School.

(INCORPORATED.)

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J. W. C. PICKERING.

EDW. D. HOLDEN.

Calendar.

1898.

Thursday and Friday, September 22 and 23. Entrance examinations for day students at 10 A. M.

Thursday, September 22. Entrance examinations for evening students at 7 P. M.

Monday, October 3. Beginning of Fall Term for day students.

Monday, October 17. Beginning of Fall Term for evening students.

1899.

Thursday, January 26. End of Fall Term.

Monday, January 30. Stated meeting of Corporation.

Monday, January 30. Beginning of Spring Term.

Friday, June 2. End of Spring Term.

Monday, Tuesday and Wednesday, November 21, 22 and 23. Mid-term examinations for day classes.

Monday, Tuesday and Wednesday, January 23, 24 and 25. Term examinations for day classes.

Monday, Tuesday and Wednesday, March 27, 28 and 29. Mid-term examinations for day classes.

Week, April 24, 25, 27 and 28. Final examinations for evening classes.

Monday, Tuesday and Wednesday, May 29, 30 and 31. Final examinations for day classes.

Vacations.

All legal holidays, from December 20 to January 4, two days in April, and two days after each examination.

Instructor in Cotton Spinning.

H. McDERMOTT.

Instructor in Chemistry.

G. C. SPENCER, S. B.

Instructor in Hand Looms.

W. K. DENNISTON.

Instructor in Weaving,

A. B. TAPLIN.

Instructor in Woolen Spinning.

M. W. McCARTHY.

Assistant in Chemistry,

A. L. BALDWIN.

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The Lowell Textile School.

The establishing of a school at Lowell for thorough instruction in the theory and practical art of manufacturing all fibers known to the textile industry, although proposed early in 1891, was not determined upon until the organization, methods and scope of such foreign schools, especially in England, France, Switzerland, Germany and Russia, had been carefully studied, and their permanence and importance to the textile interests of those countries made clearly apparent.

The success attending the Textile School which is developing at Philadelphia, and the benefits derived by the industry from the Lowell School of Applied Design, established and maintained at Boston by Augustus Lowell, Esq., left no room for doubt that American conditions were favorable to the establishment of, in fact imperatively demanded, a textile school here.

The "Trustees of the Lowell Textile School" are incorporated under a special act of the Massachusetts Legislature, "for the purpose of establishing and maintaining a Textile School for instruction in the theory and practical art of textile and kindred branches of industry."

The incorporators are representatives either as president, director, treasurer, agent or superintendent, the management of great textile corporations of Lowell, Lawrence and vicinity in the Merrimack valley with an aggregate capital of over \$25,000,000. By the terms of the By-Laws, at least three-fourths of the Trustees must be "persons actually engaged in or connected with textile or kindred manufactures." This insures the practical character of the management and instruction.

The School is located at Lowell, Massachusetts, the "Mother Textile City of America," the city and state affording financial aid in its establishment, and the manufacturers of New England being equally liberal in their contributions. The advantages of the location of the School at a textile centre where every commercial fiber enters into the products, the student thus being directly in touch with the textile industry and the management thereof, will be apparent.

The School was formally opened by Gov. Wolcott on January 30, 1897, in the presence of a large gathering of gentlemen interested in textile industries from all parts of New England. Instruction was commenced on February 1, 1897, the number of students exceeding the most sanguine expectations.



The Work of the School.

The object of the School is to give instruction in the practical knowledge necessary in the cotton, woolen, worsted and other textile industries, in sciences and art as applied to these industries. The whole plan provides for such instruction as will be found useful in textile trades.

Science and art will be taught, but not with the object of educating professional men, but with a view to industrial and commercial applications; but the School offers to graduates of universities and scientific institutions the advantage of technical instruction in the practical application of certain sciences. It also offers special facilities to those entering commercial life for obtaining such knowledge of the construction of textile fabric as is essential.

The equipment of the School consists of high grade machinery with all latest improvements, specially built to afford facilities for all kinds of experimental work, and of such variety as is never found in any one textile mill. When all the machinery that is already arranged for is installed, the School will have a more extensive equipment of machinery and plant than any other existing textile school either in America or Europe.

The staff of lecturers and instructors consists of men who, in addition to their special experience in textile school work, have been for years practically engaged in mill work as manager, designer, or in other capacities, and it is the object of the Trustees to give technical instruction that shall be equal to that of the best European schools, and at the same time of a thoroughly practical nature.

The operation of the School will be in four directions:

Day Classes.

These are especially intended for the instruction of young men whose intention it is to enter the business of textile manufacturing in any branch, and who have not been engaged in a textile trade, or who have already been engaged in such business and wish to improve their knowledge and opportunities, and who are able to devote their entire time to study. The complete collection of machinery enables every process to be practically illustrated.

The student has the option of selecting any one of four courses.

Each course is intended to extend over three years. It is optional whether or not a student attends the full course of three years, but this is strongly recommended.

There will be *one term* of preliminary instruction, for first year students, which will be common to all courses.

The instruction given in this term will consist of Principles of Mechanism, Machine Drawing, Textile Calculations, Elementary Designing and Elementary Chemistry. Towards the end of this term, by January 1, 1899, each student will be required to elect which of the four distinct courses he will follow in his subsequent studies, and the instruction to be given after the first term of the first year will be specialized to suit each course.

The courses may be summarized as follows:

1st. The *Cotton Manufacturing Course*, includes cotton picking, carding, combing, spinning, warp preparation, and weaving on all varieties of looms, and textile calculations, chemistry and dyeing, and designing.

2d. The *Woolen Manufacturing Course*, includes wool picking, carding, spinning, worsted combing, drawing, spinning, twisting, woolen and worsted warp preparation and weaving on all varie-

ties of looms, textile calculations, chemistry and dyeing, designing and cloth construction,

3d. The *Designing Course*, includes cotton, woolen and worsted warp preparation and weaving on all varieties of looms, and designing of textile fabrics, use of color in textiles, cloth analysis and reproduction, textile calculations, chemistry and dyeing.

4th. *Chemistry and Dyeing*. A course exclusively for chemistry, dyeing, printing, bleaching, etc., has been arranged.

Each of the above courses will occupy three years to complete, including the first term of preliminary instruction.

Evening Classes.

The second branch of the School work is intended to give thorough evening instruction to those who are engaged during the day in mills and work shops, to enable those who wish it to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they are engaged in the day time, and, in the course of several winters, a thorough technical education at a low cost, and without interfering with their daily labor.

Evening students have the option of entering for one or more of five different courses, and arrangements will be made for them to commence with any process, and take such a section of each course as is suitable to the student's daily occupation in the mill.

1st. Cotton picking, carding, combing, and spinning, with calculations connected with same, including practical work on the machines referred to.

2d. Woolen carding, spinning, worsted combing, drawing and spinning, woolen and worsted twisting, including practical work on the machinery and calculations connected with same.

3d. Weaving on all varieties of looms, cotton, woolen and worsted, including woolen and worsted warp preparation, practical work on the machines named and textile calculations.

4th. Designing and cloth construction in all materials, cloth analysis and reproduction, color in textiles and textile calculations.

5th. Chemistry and dyeing.

Each of the above departments is covered by a three-year course.

It is aimed to make the instruction as thorough and practical as possible. Lectures are given illustrative of the machinery and processes under consideration and timed to correspond with practical work on the same machinery and processes.

In general it is possible to take up the study of two of the above evening courses concurrently.

The time devoted to practical work both day and evening is considerably longer than that devoted to lectures, and in order to make the instruction real and thorough, as far as possible, arrangements are made by which no student is allowed to pass forward to another machine or process until he becomes thoroughly acquainted with the one on which he is engaged.

Popular Lectures.

The third means of encouraging textile instruction will be by a course of popular lectures. These lectures will be given by recognized authorities in the branches with which they deal, and afford an opportunity to the students in the school, and inhabitants of Lowell and adjacent districts who do not care to take a regular course, to attend popular illustrated textile lectures. Students who are able are recommended to take a day or evening course in addition to attending the above lectures.

Women's Department.

The fourth branch is in the direction of a Women's Department. Special day classes, in art subjects, especially in textile designing, are held.

Commercial Department.

A special course in textile construction is arranged for those contemplating a commercial career.



Buildings and Equipment.

The school building is capacious and well equipped with elevators, electric light and steam heat, and while arranged especially for school purposes, yet maintains many features of a textile mill in being of mill construction throughout, and having the sprinklers, electric motors, shafting and belting, electric and gas lighting, humidifiers, all installed in the most approved manner, and in some instances having each room equipped differently to give students an opportunity of comparing different systems.

The equipment of machinery is arranged so as to be the most complete of its kind in the world for textile educational purposes, the machinery and plant already arranged for is of a value of \$75,000, and is such as will enable raw cotton or wool to be treated in the school at every process until it becomes a woven fabric. The fact that there has been placed in the school machinery from the shops of the following firms is satisfactory proof of its excellence:—

The Lowell Machine Shop, of Lowell, Mass.

The Whitin Machine Co., of Whitinsville, Mass.

The Mason Machine Works, of Taunton, Mass.

The Crompton & Knowles Loom Works, of Worcester, Mass., and Providence, R. I.

The Atwood Machine Co., Stonington, Conn.

Davis & Furber Machine Co., North Andover, Mass.

Torrance Mfg. Co., Harrison, N. J.

Atlas Manufacturing Co., Newark, N. J.

Prince, Smith & Son, Keighley, Eng.

Stoddard, Haserick, Richards & Co., Boston, Mass.

G. S. Harwood & Sons, Boston, Mass.

The Kitson Machine Co., of Lowell, Mass.

George Draper & Sons, of Hopedale, Mass.

T. C. Entwistle, of Lowell, Mass.

Other leading makers of high grade machinery are also fully represented.

The equipment of the Cotton Department includes:—

One Automatic Feeder made by the Kitson Machine Co., Lowell, Mass.

One Single Beater Breaker, made by the Kitson Machine Co., Lowell, Mass.

One Single Beater Finisher, made by the Kitson Machine Co., Lowell, Mass.

One Top Flat Card, made by the Lowell Machine Shop, Lowell, Mass.

One Revolving Flat Card, made by the Lowell Machine Shop, Lowell, Mass.

Card Grinding Rolls, Stripping Rolls, etc.

One Sliver Lap Machine, made by the Mason Machine Works, Taunton, Mass.

One Ribbon Lapper, made by the Mason Machine Works, Taunton, Mass.

One Comb, made by the Mason Machine Works, Taunton, Mass.

One Railway Head, made by the Lowell Machine Shop, Lowell, Mass.

One Drawing Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Slubber, made by the Lowell Machine Shop, Lowell, Mass.

One Intermediate, made by the Lowell Machine Shop, Lowell, Mass.

One Fine Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Ring Spinning Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Spinning Mule, made by the Lowell Machine Shop, Lowell, Mass.

One Spooler, made by the Lowell Machine Shop, Lowell, Mass.

Wet and Dry Twister, made by the Draper Co., Hopedale, Mass.

One Reel, made by the Whitin Machine Works, Whitinsville, Mass.

The Woolen Spinning Department includes:—

Parkhurst Burr Picker, made by the Atlas Mfg. Co., Newark, N. J.

One Mixing Picker, made by the Davis & Furber Machine Co., North Andover, Mass.

One set of three Woolen Cards, including:—

First Breaker, with Bramwell Feeder, made by the Davis & Furber Machine Co., North Andover, Mass.

Second Breaker, made by the Davis & Furber Machine Co., North Andover, Mass.

Finisher, made by the Davis & Furber Machine Co., North Andover, Mass.

One Improved Breaker Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Bramwell First Breaker Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Torrance Balling Head and Creel, made by the Torrance Mfg. Co., Harrison, N. J.

Apperly Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Spinning Mule, 120 spindles, made by the Davis & Furber Machine Co., North Andover, Mass.

One Twister, made by the Davis & Furber Machine Co., North Andover, Mass.

The Worsted Spinning Department includes:—

One 50-inch Double Worsted Card (4 lickerin), made by the Davis & Furber Machine Co., North Andover, Mass., and the following machinery made by Prince, Smith & Son, Keighley, England:—

One Revolving Creel for 12 Balls.

One Double Head Can Gill Box.

One 2 Spindle Gill Box.

One 2 Spindle Drawing Box.

One 2 Spindle Weigh Box.

One 4 Spindle Finisher.

One 12 Spindle Dandy Rover.

One 12 Spindle Cap Spinner.

One 12 Spindle Flyer Spinner.

One 12 Spindle Ring Spinner.

One 12 Spindle 2 Fold Cap Twister.

One 12 Spindle 6 Fold Ring Twister.

A Comb, two Gill Boxes and a Balling Box will be installed before the opening of the Fall Term, making the Worsted Department complete in every detail.

The Cotton Warp Preparation Department consists of:—

One Spooler, made by the Lowell Machine Shop, Lowell, Mass.

One Warper, made by the Lowell Machine Shop, Lowell, Mass.

One Slasher, made by the Lowell Machine Shop, Lowell, Mass.

One Beamer, made by Mr. T. C. Entwistle, Lowell, Mass.
Drawing-in Frames, etc.

The Woolen and Worsted Warp Preparation Department consists of:—

One Warp Spooler, made by the Davis & Furber Machine Co., North Andover, Mass.

One Dresser, made by the Davis & Furber Machine Co., North Andover, Mass.

One Reel, made by the Davis & Furber Machine Co., North Andover, Mass.

One Beamer, made by the Davis & Furber Machine Co., North Andover, Mass.

Also a number of hand warping and beaming frames.

The Weaving Department which is one of the most complete in the world, having regard to the variety of looms, consists of:—

One Plain Northrop Loom, made by the Draper Co., Hopedale, Mass.

One Plain Print Cloth Loom, made by the Whitin Machine Works, Whitinsville, Mass.

One Side Cam Twill Loom, made by the Whitin Machine Works, Whitinsville, Mass.

One Five Harness Heavy Loom, made by the Lowell Machine Shop, Lowell, Mass.

One Plain Print Cloth Loom, made by the Mason Machine Works, Taunton, Mass.

And the following looms, made by the Crompton-Knowles Loom Works, Worcester, Mass., and Providence, R. I.:—

One Knowles Gingham Loom, 4 boxes.

One Knowles Fancy Cotton Loom, with 20 harness dobby, 4 boxes.

One Knowles Fancy Cotton Loom, with 25 harness dobby.

One Knowles Blanket Loom, with 25 harness dobby, 4 boxes.

One Knowles Gem Loom, 20 harness, 4 x 4 boxes.

One Knowles Worsted Loom, 32 harness.

One Knowles Fancy Loom, with single lift jacquard.

One Knowles Fancy Loom, with double lift jacquard.

One Knowles Fancy Loom, with jacquard tied up for leno.

One Knowles Ingrain Carpet Loom, 4 x 4 boxes.

One Crompton Gingham Loom, 4 boxes.

One Crompton Fancy Cotton Loom, 6 x 1, with double cylinder 20 harness dobby.

One Crompton Fancy Cotton Loom, with single cylinder 20 harness dobby.

One Crompton Jean Loom.

One Crompton Lappet Loom, with 16 harness dobby.

One Crompton Towel Loom.

One Crompton Ingrain Carpet Loom, 4 x 4 boxes.

One Crompton Worsted Loom, 27 harness.

There are also a number of hand looms, viz.:—

Twelve Hand Looms, 2 x 3 boxes, with 20 harness dobby.

Eight Hand Looms, 4 x 4 boxes, with 24 harness dobby.

Six Hand Looms, 3 x 3 boxes, with 32 harness dobby.

Six Hand Looms, 4 x 4 boxes, with 30 harness dobby.

Two Hand Looms, 4 x 4 boxes, with 32 harness dobby.

Two Hand Looms, with treadles.

Two Hand Looms, 4 x 4 boxes, with 200 hook jacquard.

Two Hand Looms, 3 x 3 boxes, with 200 hook jacquard.

Two Hand Looms, 3 x 3 boxes, with 600 hook jacquard.

The Silk Machinery consists of :—

One Winder, made by the Atwood Machine Co., Stonington, Conn.

One Quiller, made by the Atwood Machine Co., Stonington, Conn.

One Warper, made by the Atwood Machine Co., Stonington, Conn.

One Beamer, made by the Atwood Machine Co., Stonington, Conn.

One Doubling Frame, made by the Atwood Machine Co., Stonington, Conn.

Motive Power, etc.:

One 30 horse-power Motor, by the General Electric Co., Schenectady, N. Y.

Two 20 horse-power Motors, made by the Westinghouse Electric and Manufacturing Co., Pittsburg, Pa.

One complete system of fire protection, including sprinklers, air pressure system, thermostats, and other appliances, by the General Fire Extinguisher Co., Providence, R. I.

One complete humidifying plant, by the American Drosophore Co., Boston, Mass.

One complete humidifying plant, by the U. S. Aerophor Air Moistening and Ventilating Co., Providence, R. I.

The Dyeing Department is fully equipped with complete chemical laboratory with individual benches, and also small machines for dyeing, and other processes.

Calico Printing Machine, made by Mather & Platt, Oldham, England.

The School is well equipped with reels, testers and scientific instruments for experimental purposes.



Admission and Entrance Examinations.

Applications will be received from candidates not under fourteen years of age, and students may be of either sex or of any nationality. Those who have completed a grammar school, high school or other course of instruction satisfactory to the Principal, and possess certificates to that effect, will be received in the School as first year students without examination, but all others will be required to pass an entrance examination, which will be held in the case of candidates for the day classes, September 22 and 23, at 10 a. m., and for candidates for the evening classes on September 22, at 7 p. m. Students possessing certificates named above, must present them at the School prior to September 22, and have their application blanks endorsed, or they will be required to sit at the entrance examination on September 22-23. This examination will be a test of the candidates' knowledge of arithmetic, including fractions, and of English, including reading and writing.

No entrance examination will be required in case of former students in the School.

While not a requirement for admission, a High School course will be found of the greatest advantage in subsequent work, and in all cases where it is possible, it is most strongly urged that such a course be taken previous to entering this School.

Many evening students will greatly enhance the value of their work, if a course be taken at the Evening High and Drawing Schools.

The Principal will be pleased to advise candidates as to the best course to take, and to give an opportunity for consultation

on this and other points will be present at the School on Monday and Tuesday, September 19 and, 20 from 10 a. m. to 12 m., 2 to 5 and 7 to 9 p. m.

Candidates will fill out application blanks which are to be found in this catalogue or may be obtained at the School.

Fees.

The fee for the day classes is \$50.00 per term, making \$100 for the school year. There are no other charges except that students must provide their own books, stationery, tools, overalls, etc., and pay for any breakage or damage that they cause. The above fee includes free admission to any of the evening classes in which there is accommodation and which the day student may desire to attend.

The fees for the evening classes vary and are indicated elsewhere.

For cost of books and tools see index. Fees are strictly payable in advance and no student will be admitted to the classes until his fees are paid and he has obtained a card of admission.

Examinations.

Test examinations for the day classes will be held at mid-term and at the end of the Fall Term. A final examination will be held at the end of the Spring Term.

A final examination for the evening classes will also be held at the end of the Spring Term.

The results of these examinations will be considered in the grading of the student at the end of his three years' course in the School. Students who do not show sufficiently satisfactory progress in the final examination at the end of the first year will not be admitted to the second year's classes, and the same applies to second year students, with reference to their admission to the third year class.

Conduct.

Day students will be expected to attend all lectures, classes and demonstrations of practical work, except when permission to be absent has been obtained from the Principal. In case of sickness, or other unavoidable absence, written explanation must be sent. When specially required by parents, cases of absence will be reported daily.

Books will be prescribed for study and for entry of lecture notes and other exercises, and will be periodically examined by the lecturers. Day students will be expected to spend two hours daily out of school hours, in home study and entering up notes and exercises. The care and accuracy with which these books are kept will be considered in the final examinations.

Students who do not show satisfactory work in the entry of these note books and design books, will be required to spend additional time in school in order that the home exercises may be worked under the supervision of the instructors. Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order.

In the case of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly conduct, profane or indecent language, or general insubordination, will be considered good and sufficient reasons for the suspension of a student by the Principal, and for his subsequent removal from the School and forfeiture of all school privileges, if the President of the School so decides.

Apparatus used in the Dyeing or Chemical Laboratory will be provided by the School, but a deposit must be made by the student at the beginning of the term sufficient to cover its cost, and this deposit will be returned to him at the close of the term, subject to such deduction as will reimburse the School for broken or damaged articles.

Library.

The School library is supplied with all the leading textile books and with works dealing with sciences, art or industries allied to the textile trades. The leading textile trade papers, both American and European, are obtained. The library will be open to duly qualified students of the School in afternoons.

Length of Session.

The Fall Term of 1898 will commence on Monday, October 3, and end January 26, 1899. The Spring Term of 1899 will begin on January 30 and end on June 2. The day school will be in session from 9 a. m. to 12.30 p. m. each morning excepting Saturdays. There will be afternoon sessions from 2 to 5 o'clock excepting Wednesdays and Saturdays. There will be vacations on all legal holidays, also from Wednesday, December 21, to Wednesday, January 4, and also for two days after each examination.

A schedule will be prepared showing the time to be devoted to each subject and the hours at which the various classes meet. This will be rigidly adhered to and the register will be marked at the beginning of each lecture or demonstration. Individual students may by special permit be excused from attendance at certain classes, but not in such a way as to reduce the fees payable.

General.

Students from a distance, requiring rooms and board in the city, may, if they desire it, select same from a list of houses which is kept at the School. The cost of rooms and board in a good district is from \$4 per week upwards.

All raw stock and yarn will be provided by the School and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student will be allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated as prescribed by the Principal, and facilities will be given for the preparation of a collection of such fabrics as are produced in the School, with all instructions for their manufacture. It is understood that the Trustees may retain in the School such other specimens of students' work as the Principal may determine.

Prospective students who are desirous of arranging special courses by omitting a portion of one course, adding a portion of another, or in any other way, are invited to communicate with the Principal.

An additional entrance examination to suit the convenience of students from a distance (out of New England), may be arranged.

Lock boxes will be provided, free of charge, for the use of the students, sufficiently capacious to contain clothing, books and tools.

No books, instruments, or other property of the School, will be loaned to students, or allowed to be removed from the premises.

Facilities will be given for visits by day students to New England mills and works during the session.

The following mills and workshops have been visited during the past term:—

Tremont & Suffolk Mills, Lowell, Mass.

Washington Mills, Lawrence, Mass.

Lowell Manufacturing Company, Lowell, Mass.

Lowell Machine Shop, Lowell, Mass.

Kitson Machine Shop, Lowell, Mass.

Massachusetts Cotton Mills, Lowell, Mass.

Lowell Hosiery Company, Lowell, Mass.

Hamilton Print Works, Lowell, Mass.
Merrimack Print Works, Lowell, Mass.
Lowell Plush Co., Lowell, Mass.
New England Bunting, Lowell, Mass.
Davis & Furber Machine Co., North Andover, Mass.
Emmons Loom Harness Co., Lawrence, Mass.
Nashua Mfg. Co., Nashua, N. H.
Stirling Mfg., Lowell, Mass.

Materials.

Students must purchase such tools, instruments, text books and apparatus as may from time to time be recommended by the head of each department, and the cost of these for day students will be from \$10.00 to \$15.00, and for evening students from \$2.00 upwards, according to the subject studied.



Plan of Studies, Day Classes.

Cotton Manufacturing Course.

First Year.—First Term:

Elementary Course Calculations.	} Common to all Courses.
Elementary Course Designing and Cloth Analysis.	
Elements of Mechanism.	
General Chemistry.	
Elementary Course Machine Drawing.	

Second Term:

Cotton Selection, Picking and Carding.
Spooling, Warping and Slashing.
Calculations.
Elementary Designing and Cloth Analysis.
Elements of Mechanism.
Machine Drawing.
General Chemistry Continued.

Second Year.—First and Second Terms:

Combing, Drawing, Fly Frames, Ring Spinning and Mule Spinning.

Final Course Applied Mechanics.

Final Course Machine Drawing.

Plain Weaving.

Weaving on Dobby Looms, Box Looms, Towel Looms, and Instruction on Weaving Mechanism.

Textile Chemistry and Dyeing.

Final Course Calculations.

Final Course Machine Drawing.

Designing.

Third Year.—First and Second Terms:

Spooling, Twisting, Warping, Gassing, Bundling, Spinning Mill Construction and Equipment, and Mill Statistics.

Lappet, Leno and Jacquard Weaving, Weave Mill Engineering and Statistics.

Final Course Textile Designing, also General Research and Thesis Work.



Wool Manufacturing Course.

First Year. — First Term :

Elements of Mechanism.	} Common to all Courses.
Elementary Course Designing and Cloth Analysis.	
General Chemistry.	
Elementary Course Machine Calculations.	
Elementary Course Machine Drawing.	

First Year. — Second Term :

Wool Sorting, Scouring, Carbonizing, Picking, Carding and Spinning.
Woolen and Worsted Spooling, Warping and Dressing.
Elementary Designing.
Machine Drawing.
Elements of Mechanism.
General Chemistry Continued.

Second Year. — First and Second Terms :

Worsted Carding, Combing, Drawing, Roving and Spinning.
Plain Weaving.
Weaving and Weaving Mechanism, including Dobby Looms and Box Looms.
Textile Chemistry and Dyeing.
Applied Mechanics.
Machine Drawing.
Machine Calculations.
Designing and Cloth Analysis.

Third Year. — First and Second Terms :

Wool and Worsted Mill Engineering and Statistics.

Weaving Mechanism, including Leno, Lappet, Carpet and
Jacquard Looms, Weave Mill Statistics and Engineering.
Designing for Jacquards, Original Designing, and putting
same into cloth.

General Research and Thesis Work.



Chemistry and Dyeing Course.

First Year.—First Term:

Elementary Course in Machine Drawing.
Elementary Course in Designing.
Course in General Chemistry.
Elements of Mechanism.
Elementary Course in Calculations.

Second Term:

General Chemistry (Continued).
Qualitative Analysis.
Stoichiometry.
Machine Drawing (Continued).
Dyeing Continued (or) Warp Preparation and Weaving.
Elements of Mechanism.

Second Year.—First and Second Terms:

Textile Chemistry and Dyeing.
Review of Inorganic Chemistry.
Organic Chemistry (Continued).
Designing, Cloth Construction and Analysis (or) Principles
of Woolen and Worsted Manufacture.

Third Year:

Quantitative Analysis.
Industrial Chemistry.
Advanced Work in Textile Chemistry and Dyeing.
Dye Testing, and Detection of Mordants and Dyestuffs on
the Fibre.
General Research and Thesis Work.

Designing Course.

First Year. — First Term:

Elementary Course in Machine Drawing.	} Common to all Courses.
Elements of Mechanism.	
Elementary Course in Calculations.	
Elementary Course in Design and Cloth Analysis.	
General Course in Chemistry.	

Second Term:

Cloth Construction and Designing in Cotton, Woolen and
Worsted.
Fabric Calculations and Cloth Analysis.
Hand Loom Work.
Elements of Mechanism.
Instruction in Art Department, Free Hand Drawing and
Color.
Spooling, Warping, Slashing and Dressing.
General Chemistry Continued.

Second Year. — First and Second Terms:

Cloth Construction and Designing in Cotton, Woolen and
Worsted.
Fabric Calculations and Cloth Analysis.
Art Department.
Hand Loom Work.
Plain Weaving, Dobby and Drop-box Looms, and Instruc-
tion on Weaving Mechanism.
Textile Chemistry and Dyeing.

Third Year. — First and Second Terms:

Designing, including Jacquard Work.
Weaving Mechanism, including Leno, Lappet, Carpet and
Jacquard Looms, also Weave Mill Statistics and Weave
Mill Construction.
Original Work in Designing and in Putting Designs into Looms.

*List of
Departments,
Lectures
and
Practical Work.*

Cotton Department.

CHARLES C. HEDRICK. Professor of Cotton Spinning.

First Year :

1. The Cotton Fibre.

Cotton selection.

Classification of cotton.

Varieties of cotton from different parts of the world.

The cotton gin.

Hand and mechanical methods of mixing and distributing cotton from the bale.

The construction of the Automatic Feeder.

The construction of the Opener.

The construction of the Breaker.

The construction of the Intermediate and Finisher Lappers.

The operation and care of Picking Machinery.

Theory of Carding and development of Carding Machinery.

The stationary Top Card.

The revolving Top Card.

Card Grinding, Setting, Stripping, and Care of Cards.

2. Practical work on machines named in above lectures timed to correspond with lecture course.

3. Lessons on calculations in connection with the machines named above.

Second Year :

1. Course of lectures on the following subjects :

Construction and use of the Railway Head.

Principle of Drawing processes.

Construction and care of the Drawing Frame.

The development of the Fly Frame.

The construction and use of the Slubbing Frame.

The construction and use of the Intermediate Frame.

The construction and use of the Fine Frame.

The operation and care of the Flyer Frames.

The construction and use of the Ring Spinning Frame.

2. Practical work on machines named in the above lectures timed to correspond with the lecture course.

3. Lessons on calculations connected with the above machines.

Third Year:

1. Course of lectures on :

Construction and use of the Cotton Comb.

Construction and use of the Sliver Lap Machine.

Construction and use of the Ribbon Lap Machine.

The operation and care of Combing Machinery.

The construction and use of the Spinning Mule.

The construction and use of the Spooler.

The construction and use of the Warper.

The construction and use of the Slasher.

Drawing-in.

2. List of machinery adapted for different purposes in Cotton Mill Work.

Layout of machinery for different processes.

Mill engineering.

Mill buildings, different styles of construction.

Power for Cotton Mills, steam or water.

Transmission of power by belting, ropes, gearing or electricity.

Fire protection, inside and outside—different systems.

3. General research and experimental work and preparation of thesis.

Woolen and Worsted Department.

WOOLEN SPINNING.

EDGAR H. BARKER, Professor of Woolen and Worsted Spinning.

Day Students. — First Year :

Lecture Course:

Animal and vegetable fibres.

Discussion of the various kinds of Wool and their uses.

Wool Sorting.

Manufacture and use of Shoddies, Mungoes, Extracts, Flocks and Noils.

Wool Washing, including the construction and uses of Washing Machines and Hydro-Extractors, and materials used as Detergents.

Carbonization, Wet and Dry Processes.

The Solvent Process for cleansing Wool.

Construction and uses of Dryers (Table and Artificial).

Shrinkage of Wool in Washing.

Construction and uses of the several kinds of Pickers, Burr-ing and Garnetting Machines.

Picking, Mixing, Blending and Oiling of Lots.

Kinds and quantities of Oil. Testing.

Principles of Carding.

Carding in the First Breaker, Second Breaker and Finisher.

Condensers — Single and Double Doffers, Bollette, Ring, etc.

Setting and uses of the various parts of the Card.

The various kinds of Feeds, — Hand, Bramwell, Apperly, Camelback, Torrance, Balling Head and Creel, etc.

Card Clothing, — various kinds of Backing (Leather, Linen, Flexifort, etc.) Kinds and sizes of Wire Garnett.

Method of counting Card Clothing (counts and crowns).

Setting up Cards, turning up Cylinders, clothing the Card, grinding.

Speeds, production, etc.

Principles of spinning.

History and development.

Hand Jack, self-operating and self-acting Mules.

The Mule-head.

Method of driving the various parts, Rolls, Spindles, Carriage, etc.

Backing off.

Winding Mechanism.

Study of the Quadrant and Builder-rail.

Regulation of the Fallers.

Twisting.

With the above lectures will be given all the necessary calculations and actual practice on the various machines.

WORSTED SPINNING.

Lecture Course:

The differences between a Worsted and a Woolen Thread.

Carding.

Preparing.

What wools are Prepared and why they are not Carded.

Doubling and Back Washing,—the nature of these processes.

The principles, history and development of Combing.

Combing on the Noble and Lister Machines.

Pin Setting.

Gilling and Top Making.

The hygroscopic property of Wool.

Conditioning of Tops.

Principles of Drawing.

Construction of the Drawing and Roving Frames.

Drawing on the Open, Cone and French Systems.

Study of the Drag.

Stop Motions.

Construction and uses of Gauge Points.

Principles of Spinning.

Spinning on the Cap, Flyer and Ring Frames.

Worsted Mule Spinning.

Types of Frames (Leicester and Illingworth).

Spinning of Carpet and Botany yarns.

The system of counting Worsted yarns.

Doubling and Twisting, including the construction and uses
of the various kinds of Twisters.

Winding, Hanking, Balling and Bundling.

Yarn Testing, etc.

The above lectures include all the necessary calculations and
actual practice on the various machines.

Third Year:

Manufacture of fancy yarns.

Fancy mixed yarns.

Woolen and cotton.

Woolen and silk.

Woolen and worsted.

Union yarns (Worsted and Cotton).

Two, three and more, ply fancy twists.

Fancy knotted yarns, Knickerbocker, etc.

Loop, slub and mottled yarns.

Color as applied to fancy yarns.

Layout of machinery for different processes.

Mill engineering.

Mill buildings, different styles of construction.

Power for Mills, steam or water.

Transmission of power by belting, ropes, gearing or
electricity.

Humidifying and Humidifiers.

Fire protection, inside and outside—different systems.

Cost of mill machinery.

Mill statistics.

Cost of operation, and so on.

General research and experimental work and preparation of thesis.

WORSTED SPINNING.

Evening Students:

The course will extend over one entire school year and will comprise the following:—

Lecture Course:

Animal and vegetable fibre.

Discussion of the various kinds of Wool and their uses.

Wool Sorting.

Wool Washing, including the construction and uses of Washing Machines and Hydro-Extractors, and materials used as Detergents.

Carbonization, Wet and Dry Processes.

The Solvent Process for cleansing Wool.

Construction and uses of Dryers (Table and Artificial).

Shrinkage of Wool in Washing.

Construction and uses of the several kinds of Pickers, Burr-ing and Garnetting Machines.

Oiling of Wool (kinds and quantities used).

Oil testing.

Principles of Carding.

Setting and uses of the various parts of the card.

Hand and Self Feed (Bramwell, etc).

Card Clothing, various kinds of Backing (Leather, Linen, Flexifort, etc). Kinds and sizes of Wire, Garnett, etc.

Method of counting Card Clothing (counts and crowns).

Setting up Cards, turning up Cylinders.

Clothing the Card, Grinding.

Speeds, Production, etc.

Preparing.

What Wools are Prepared and why they are not Carded.

Doubling and Back Washing,—the nature of these processes.
The principles, history and development of Combing.
Combing on the Noble and Lustre Machines.

Pin Setting.

Gilling and Top Making.

The hygroscopic property of Wool.

Conditioning of Tops.

Principles of Drawing.

Construction of the Drawing and Roving Frames.

Drawing on the Open, Cone, and French Systems.

Study of the Drag.

Stop Motions.

Construction and use of Gauge Points.

The use of the Slide Rule in Drawing and Spinning calculations.

Principles of Spinning.

Spinning on the Cap, Flyer and Ring Frames.

Worsted Mule Spinning.

Types of Frames (Leicester and Illingworth).

Spinning of Carpet and Botany yarns.

The system of counting Worsted yarns.

Doubling and Twisting, including the construction and uses of the various kinds of Twistors.

Winding, Hanking, Balling and Bundling.

Yarn Testing, etc.

The difference between a Worsted and Woolen Thread.

The above lectures include all the necessary calculations and actual practice on the various machines.

WOOLEN SPINNING.

Evening Students :

The course will extend over one entire school year. The work will be the same as for the day students.

Chemistry and Dyeing Department.

REGULAR COURSE IN CHEMISTRY AND DYEING FOR DAY STUDENTS.

LOUIS A. OLNEY, A. C., Professor of Chemistry and Dyeing.

Course I:

The regular course in Chemistry and Dyeing for day students extends through three entire school years, and is especially recommended to those who intend to enter into any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry.

In addition to receiving a thorough knowledge of the principles of all branches of dyeing, printing, bleaching, etc., the student, by application, study, and conscientious performance of all the prescribed laboratory and practical work, should become efficient in the subject of Textile Chemistry, and the methods of testing the various dyestuffs, mordants, etc.

The requirements for admission to this department are at present the same as for the others, but all students intending to take the regular Chemistry and Dyeing course would find it greatly to their advantage if they should acquaint themselves with the elementary principles of physics before entering.

Upon completion of this course, each student is required to present a thesis and do a certain amount of original work on some subject appropriate to this department. When this thesis has been accepted by the head of the department, and examinations successfully passed in all required subjects, the student shall be entitled to the regular school diploma.

*PLAN OF STUDIES IN COURSE I.

First Year. First Term:

General Chemistry. (See ¶ A, subsequent page.) Lectures, Recitations, Laboratory Work.

Second Term:

General Chemistry, continued. Lectures, Recitations, Laboratory Work.

Qualitative Analysis. (See ¶ B, subsequent page.) Lectures, Recitations and Laboratory Work.

Stoichiometry. (See ¶ C, subsequent page.) Lectures and Recitations.

Second Year:

Textile Chemistry and Dyeing. (See ¶ D, subsequent page.) Lectures, Recitations, Laboratory Work.

General Chemistry. Review of Inorganic Chemistry; continuation of Organic Chemistry.

Third Year:

Quantitative Analysis. (See ¶ F, subsequent page.) Lectures, Laboratory Work.

Industrial Chemistry. (See ¶ E, subsequent page.) Lectures, Laboratory Work.

Advanced Work in Textile Chemistry and Dyeing.

Dye Testing and Detection of Mordants and Dyestuffs on the Fibre.

General Research and Thesis Work.

The general course in Textile Chemistry and Dyeing is placed in the second year so as to give the students who are not

*This only includes those subjects directly connected with the chemistry and dyeing department. A complete plan of this course will be found on page 37.

able to attend three years, an opportunity of acquainting themselves with the fundamental principles of Textile Chemistry and Dyeing in two years.

The School will give thorough and exhaustive education in Textile Chemistry and Dyeing. The studies will be taken up from both a theoretical and practical point of view, and a large amount of work will be required in the chemical laboratory, which is fitted with a complete set of necessary apparatus and chemicals.

It is not only advisable but necessary that a student should have a thorough knowledge of general chemistry before taking up the subject of textile chemistry.

Consequently no student will be allowed to take the third year of this course who has not taken the first and second, or the second year who has not taken the first year, unless he or she can successfully pass a prescribed examination or present a satisfactory certificate for the previous work.

BRIEFER COURSE IN CHEMISTRY AND DYEING FOR DAY STUDENTS.

Course II:

This course will extend through two entire school years, and may be taken by the day students in the woolen and worsted, cotton manufacturing, designing or art department.

It will consist of:—

First Year:

Course in General Chemistry. (See ¶ A, subsequent page.)

**Second Year.*

Course in Textile Chemistry and Dyeing. (See ¶ D, subsequent page)

*See foot note, next page.

The object of this course will be to give those intending to make a specialty of any branch of Textile Work other than Textile Coloring, a general and comprehensive idea of Textile Chemistry and Dyeing, not that they may become expert chemists and dyers, but that they may be familiar with all the departments of their future work.

REGULAR COURSE IN CHEMISTRY AND DYEING FOR EVENING STUDENTS.

Course III:

The evening course in this department will extend through two entire school years and will be made up as follows:—

First Year:

Course in General Chemistry. Tuesday and Thursday Evenings. (See ¶ A, subsequent page.)

**Second Year:*

Course in Textile Chemistry and Dyeing, Monday Evenings. (See ¶ D, subsequent page.)

It is not only advisable but necessary that a student should have a thorough knowledge of general chemistry before taking up the subject of textile chemistry.

Consequently no student will be allowed to take the second year of this course who has not taken the first, unless he or she can successfully pass a prescribed examination, or present a satisfactory certificate for the previous work.

*The interest shown in this department during the past year has surpassed all expectations, and the number of applications for the coming year is so large that it will be impossible to give laboratory work in dyeing to other than those taking the regular course in chemistry and dyeing. (See Course I, preceding page.) By another year, the dyeing plant will be so enlarged as to be adequate accommodation of all desirous of taking up this line of work. In this case, for the those taking the course of lectures this year will be able to take practical laboratory work the following year if they desire.

A.—GENERAL CHEMISTRY.

This subject is required of all students taking the regular course in Chemistry and Dyeing and all others intending to take up the study of Textile Chemistry and Dyeing later.

It will include lectures, recitations, and a large amount of individual laboratory work upon the following subjects, and will extend through one entire school year:—

Chemical Philosophy.—Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc., etc.

Non-Metallic Elements.—Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements.—Study of their occurrence properties, metallurgy, chemical compounds, etc.

The Hydrocarbons and their Derivatives.—Study of their occurrence, properties, preparation, uses, etc.

Qualitative Analysis.—Before the completion of the course, the students will take up, as thoroughly as the time will permit, the qualitative detection of the more common metals and non-metals, with practical work.

No pains will be spared in giving the student a thorough training in fundamental principles of the science.

The course will consist of sixty hours of lectures and recitations, and one hundred and twenty hours of laboratory work, but those taking Course I will take more than double this amount of work.

B.—QUALITATIVE ANALYSIS.

Qualitative analysis will be studied by the students taking the regular Chemistry and Dyeing course, during the second term of the first year.

The subject is taught in a thorough manner, and in addition to lectures and recitations, at least fifteen hours per week of laboratory work are required, and before completing the course, in addition to a large amount of preliminary laboratory work, each student must satisfactorily analyze at least 30 solutions and 10 solids containing any of the common metals and acids, and six alloys containing any of the common metals. At the close of the course, each student will be required to pass a written examination upon the subject, as well as a practical examination involving the analysis of a solution and a solid, each of which will contain at least ten of the common metals and acids.

C.—STOICHIOMETRY.

This subject will be taken up by the chemistry and dyeing students during the second term of the first year. Special attention will be paid to the writing of the chemical equations, representing the chemical reactions involved in the qualitative analysis. The application of the metric system will be carefully studied, as well as the different thermometric and specific gravity scales, and problems will be worked by the students involving the expansion and contraction of gases, determination of percentage composition of chemical compounds, etc., etc.

D.—TEXTILE CHEMISTRY AND DYEING.

The general treatment of this subject will come during the second year, for all three of the courses in the Chemistry and Dyeing Department.

Outline of subjects taken up:—

Technology of Vegetable Fibres.—Cotton, linen, jute, hemp, China grass, etc. Chemical and physical properties, chemical composition, microscopical study, action of chemicals, acids, alkalies, heat, etc.

Technology of Animal Fibres.—Wool, silk, etc. Chemical and physical properties, chemical composition, microscopical study, action of chemicals, acids, alkalies, heat, etc.

Operations Preliminary to Dyeing.—Bleaching of cotton and linen, wool scouring and bleaching, silk scouring and bleaching, etc., etc.

Water and its Application in the Textile Industry.—Impurities present, the methods of their detection, their effect during different operations, and methods for their removal or correction.

Mordants and other Chemical Compounds used in textile coloring not classed as dyestuffs.—Theory of mordants, their chemical properties and their application, aluminium mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, sulphated oil, fixing agents, leveling agents, assistants, etc.

Theory of Dyeing.—Chemical, mechanical, solution, etc.

Natural Coloring Matters.—Origin, properties, application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, turmeric, madder, quercitron bark, Persian berries, etc., etc.

Artificial Coloring Matters.—General discussion of their history, nature, source, methods of manufacture, and methods of classification.

Special study of :—

Direct Cotton Colors.

Basic Coloring Matters.

Acid Dyestuffs.

Phthalic Anhydride Colors, including the eosins, rhodamines, phloxines, etc.

Alizarin Colors, including other artificial coloring matters requiring a metallic mordant.

Insoluble Azo Colors, developed on the fibre.

Aniline Black, artificial indigo, and other artificial dyestuffs not coming under the above heads.

Machinery Used in Dyeing.—

Besides lectures and recitations upon this subject, those taking the regular day course in Chemistry and Dyeing will be required to do at least fifteen hours per week of practical laboratory work. By the performance of careful and systematic experiments the student will learn the nature of the various dye-stuffs and mordants, their coloring properties, their action under various circumstances, and the conditions under which they give the best results. The more representative dyestuffs of each class will be applied to cotton, wool and silk, and each student will be obliged to enter in an especially arranged sample book, a specimen of each of his dye trials, with full particulars as to conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy, most of the dye trials will be made upon small skeins or swatches of the required material, but from time to time the students will be required to dye larger quantities.

By the use of a small printing machine the principles of calico printing, and by the introduction of small dyeing machines, vats, etc., the practical side of the subject will be studied, and it will be the constant endeavor of those in charge to impart such information of a theoretical and scientific character as is usually difficult to obtain in a dyehouse.

E.—INDUSTRIAL CHEMISTRY.

A course of lectures upon this subject will be delivered during the third year, particular attention being paid to those branches which are of special interest to the textile chemist, as oils, soaps, the gas and coal tar industry, building materials, and the manufacture of the important chemical compounds, acids, alkalies, bleaching powder, various mordants, etc., on the large scale.

The lectures will be illustrated as far as possible with experiments, specimens, diagrams, and charts, and the students will be given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

F.—QUANTITATIVE ANALYSIS.

This is a third year subject for the students in the Chemistry and Dyeing course.

In addition to lectures and recitations each student will be required to do a considerable amount of quantitative analytical work. He will become familiar with the use of the analytical balance, perform numerous simple analyses, both gravimetric and volumetric, and before the completion of the subject take up the analysis of acids, alkalies, soap, coal, water, bleaching powder, lime, etc.



Design Department.

DESIGNING OF FABRICS DEPARTMENT.

FENWICK UMPLEBY, Professor of Textile Design and Fabric Structure.

First Year.

1. Course of lectures on cloth construction and designing in Cotton, Woolen and Worsted. Subjects:

Classifications of fabrics.

Plain fabrics and fabrics on a plain cloth basis.

Names and explanation of different parts of cloth and terms applied to weaves, etc. Point or design paper.

Methods of representing weaves, drafts, etc., on paper.

Explanation of harness and chain drafts.

Twill cloth and combinations of same.

Broken twills.

Sateens.

Combination of weaves.

Figured weaving on plain ground.

Diapers, coatings, trouserings.

Colored goods, stripes.

Checked goods.

2. Practical work and teaching on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc., on paper, including yarn and cloth calculations as below.

3. Practical work on hand looms, putting into operation the principles taught in the foregoing course.

Yarn and cloth calculations.

4. The uses of textile calculations, methods of naming or counting cotton, worsted and linen yarns.

Methods of naming woolen yarns.

Methods of naming silk yarns.
Comparative calculations for converting one system of yarns
into that of another.
Calculations for folded or ply yarns.
Calculations to find weight, count or length of warp, from
given data.
Calculations for reeds.
Calculations for harness, straight, centred, or pointed draft.
Calculations for harness, spaced and in combinations.
Calculations for shrinkage, or contraction.
Calculations for the quantities of material required to make
plain and striped warps.
Calculations for the quantities of filling required to make
plain and checked fabrics.
Calculations to find the number of ends per inch in order to
use a given weight of warp, also picks per inch to use a
given weight of filling.
Calculations on the proportioning of fabrics.
Practical lessons in color effects.
Combinations of colored threads.
Color definition.
Color nomenclature.

INSTRUCTION.

Second Year.

Lecture Course:
Construction of Cloth.
Balance of Cloth.
Cloth made with or ornamented by extra warp.
Cloth made with or ornamented by extra filling.
Double and Triple Cloths.
Cotton, Fancy Sateen Stripes.
“ Gauze.

Cotton, Leno.

“ Lappet.

“ Velvets.

“ Plushes.

“ Pile fabrics, cut and uncut.

Color and color effects.

Color definition.

Color nomenclature.

Fancy Woolen Cassimeres.

Trouserings, Suitings and Coatings.

Figured Matelasses.

Worsted and Mohair Mantle Cloths.

Figured Blankets.

Carriage Robes.

Shawls.

Figured double plain.

Reversibles.

Practical work and teaching of cloth analysis and reproduction of fabrics, and on planning patterns, drafts, chains, etc., on paper, including all necessary calculations.

Amount of material required for laying out lots for mixes and twisted yarns.

Amount of material used in the construction of fabrics, analysis to consist of Cotton Dress Goods, Gingham and Fancy Weave Dress Goods.

Fancy Woolen and Worsted Cassimeres.

Woolen and Worsted Suitings.

Woolen and Worsted Tricots.

Overcoatings.

Double Cloth and Ingrain Carpets.

Practical work on hand looms, putting into operation the principles taught in the foregoing course.

Third Year Course.

Lecture course:

Color definition.

Color nomenclature.

Jacquard Designing.

Casting Out.

Distribution of Patterns.

Determination of areas occupied by the figures.

Jacquard figures formed with warp.

Jacquard figures formed with filling.

Figures not square.

The principles of designing, cloth structure and coloring best adapted to each of the above fabrics.

Cloth formed by the combination of Jacquard gauze and fancy weave harness weaves.

Jacquard pile and ordinary weaves.

Special designs for Jacquard gauze, and pile fabrics.

Designing—vestings, quiltings, lappet, gauze and fancy pile fabrics.

Analysis.

The structure and analysis of all descriptions of compound fabrics, viz.: backed, double, and various types of Jacquard figured fabrics, specially applicable to the Cotton and Worsted industries.

Calculations necessary in determining the departmental and total cost of production of any fabric from given data of values of material, labor, etc., by ascertaining the fibre, counts, threads, picks, weight, shrinkage, etc.

Hand and power loom practice, putting into operation the principles taught in the foregoing course.

Weaving Department.

POWER LOOM WEAVING DEPARTMENT.

Professor of Weaving, WILLIAM NELSON.

First Year.

1. Course of lectures on Weaving Machinery and Processes, as used for Cotton, Woolen and Worsted, including Warp Preparation. Subjects:—

Process of making pattern warps.

The construction and use of Spooling Machinery for wool and cotton.

The construction and use of Warpers of various kinds.

The Woolen Sizing Machine.

The Woolen Beamer.

Sizing materials and size mixing machinery.

Long and short chain systems of preparing warps and filling.

Drawing-in and twisting.

2. Practical work on machines named above, and warp preparation in cotton, woolen and worsted, timed to correspond with the respective lectures.

3. Lessons on calculations applied to the machines and processes named above.

Second Year.

1. Course of lectures on weaving mechanism, as under:—

The plain power loom and its construction.

Shedding by cams.

Various pickers and picking motions.

Fast and loose reeds.
Take up and let off motions.
Minor adjustments of the power loom.
Plain looms as altered for weaving fancy cloth.
Looms constructed for several shuttles.
Drop box motions.
Shedding motions.
Single acting dobbies.
Double acting dobbies.
Spring boxes and other motions for returning harness.
Chain building for dobbies.
Chain building for box looms.
Various handkerchief motions.
Lappet motions.
Towel and other pile cloth weaving.
Open and close shed looms.
Gauze and Leno weaving.

2. Practical work on the above looms, including teaching the student to weave and fix looms.

Also pulling down looms and rebuilding same, including timing, setting, and fixing one part in relation to another.

This work will be arranged to correspond with the respective lectures.

3. Lessons on calculations applied to the machines and processes named above.

Third Year.

1. Lectures on Jacquard machinery.

Single lift Jacquards.

Double lift Jacquards.

Leno Jacquards.

Jacquards specially arranged for such work as ingrain carpet work.

Tapestry weaving, quilt weaving, and so on.

Weave room, engineering and equipment.

Cost of weave mill operation and statistics of operation.

The humidifying, lighting and fire protecting of weave mills.

Finishing Department :

Knotting and burling.

Fulling, construction of the several kinds of fulling machines.

Gigging, construction of the gig.

Shearing, construction of the shear.

Pressing, construction of the several kinds of presses.

Measuring and weighing, ticketing, numbering and rolling.

Cloth folders.

Cloth brushers.

Baling and casing of cloth for shipment.

2. General experimental and thesis work, to be conducted by arrangement with the head of the department and under his supervision.



Decorative Art Department.

VESPER L. GEORGE, Professor of Decorative Art.

The close relation Decorative Art bears to the textile industry requires the organization of a Decorative Art Department.

While it is the special object of the School to give instruction in this department of such a character as to develop a knowledge of the laws of decoration and theory of design as applied to textile fabrics of every kind, it is a fact that the fundamental instruction necessary for this is similar to that required for other branches of decorative art, so that students not necessarily intending to follow textile manufacturing are invited and may attend with advantage.

Special arrangements have been made to form classes in freehand drawing and decoration, for the purpose of giving the students general instruction in the theory and practice of decorative art, the instruction afterwards to be devoted to the special branch the student desires to follow. The School will thus fulfill the object of preparing the student in practical designing in any of the branches of decorative art, with special regard to fabrics.

Day Course.

DECORATION.

Class 1. Instruction and training of hand and eye in Free-hand and Geometrical Drawing. Tuesday mornings. Hours from 10 a. m. to 1 p. m.

Class 2. Advanced instruction and practice in Freehand and Geometrical Drawing. Thursday mornings. Hours from 10 a. m. to 1 p. m.

Class 3. Instruction in line, form, color and tone, based on historic ornament. Tuesday afternoons. Hours from 2 p. m. to 4 p. m.

Class 4. The application of natural (conventionalized) forms,—plants, etc.,—according to the laws that have been evidenced by the study of historic ornament, with special reference to textile design. Thursday afternoons. Hours from 2 p. m. to 4 p. m.

These studies are preparatory and essential to excellence in sketching for Jacquard fabrics, damasks, ingrain, brussels and other carpets, grenadines, bed spreads, table cloths, etc., and general applied textile design, and equally so to any other branch of Decorative Art.

The fee for the day course will be \$15.00 per term.

Additional Classes.

If there is sufficient demand, there will be additional classes established in other departments of Decorative Art, when this can be done without interfering with the regular school course.

Those desiring such instruction are invited to correspond with the Principal with a view to the formation of any such special classes.

Public Art Lectures.

Prof. George will give afternoon or evening lectures on Art subjects from time to time, which will be illustrated by examples of fabrics and by the stereopticon, and will be announced in the local papers.

General.

The fees in all cases are payable in advance, and no student will be allowed to enter the class until he has paid his fees and obtained a card of admission.

Each student is required to fill out an application blank, which may be had on request. The Head of the Art Department will determine whether students shall enter the elementary or advanced freehand classes, and for this purpose will attend the School on September 22, from 2 to 5 in the afternoon and 7 to 9 in the evening, to interview the students and to inform each student to which class he will be assigned.

The materials to be purchased will probably cost \$10.00 and upwards, unless the student already possesses drawing instruments, paint boxes, brushes, etc., in which case the amount will be considerably reduced.



Mechanics.

DEPARTMENT OF MECHANICS.

WM. W. CROSBY, S. B., Professor of Mechanics.

First Year.

Course of lectures on definition of parts of machines.

Force, work, and the measurement of same.

Levers.

Wheel and Axle.

Pulley Blocks.

Inclined Plane and Wedge.

The Screw and its applications.

Toothed Gearing.

Pulleys and Belting.

Lessons on Calculations.

Definition of measurements of pulleys and gearing.

Calculations of speed of shafts, pulleys, belts and gearing.

Alterations of speeds and sizes of pulleys and gears.

2. - Machine Drawing.

Second Year.

1. Advanced Course in Applied and Theoretical Mechanics.

2. Advanced Course in Machine Drawing.

Evening Classes.

The plan of evening instruction includes all the subjects taught in the day classes, with several additional ones, but as the time at the disposal of those who work in the mill is limited, there is no necessity or even possibility of taking all the subjects in one session. Certain groupings of subjects have been arranged, and it is strongly recommended that those who have the time to devote take up one group. It is possible in some cases to take two groups, such as Spinning and Weaving, or Weaving and Dyeing, or other combinations. This is not recommended unless the student has considerable time to devote to study out of school.

It is also possible to take a 1st year and a 2nd year course in one year in the Cotton Course, thus covering the whole course. This can be done also in the Weaving Course, and in the Woolen and Worsted Course. This arrangement is made for the benefit of those whose stay in Lowell is limited to one winter, but is not recommended unless the student has four evenings per week to devote to work in the school and an additional amount of spare time to devote to study out of school. The fees in a case of taking two courses in one are of course doubled.

The fees charged for each group, although including instruction in every respect similar to the day school, are arranged so low in most cases as to merely cover the cost of the materials used. The fees for the whole year are twice the amount named below.

Where several evenings are named for practical work in one subject the student will be present on one evening only, and is requested to state on his application blank which evening he prefers.

Worsted Spinning.

Course of lectures on Worsted Spinning, including calculations and practical work. For subjects of lectures see preceding part of catalogue.

Hours, Lectures and Recitations, Monday evenings, 7.30 to 8.30 o'clock, and to 8.30 to 9.30 o'clock.

Practical work, Thursday evenings, 7.30 to 9.30 o'clock.

Fee for this subject \$2.50 per term.

Woolen Spinning.

Course of lectures on Woolen Spinning, including calculations and practical work. For subjects of lectures see preceding part of catalogue.

Hours, Lectures and Recitations, Tuesday evenings, 7 to 8 o'clock, and 8 to 9 o'clock.

Practical work, Friday evenings, 7 to 9 o'clock.

Fee for this subject \$2.50 per term.

Cotton Spinning.

Course of lectures on Cotton Fibre, Picking, Carding, Combing and Spinning. For list of subjects see page 41.

Hours, First Year Students, 7 to 8 o'clock, and 8 to 9 o'clock, Tuesday evenings.

Hours, Second Year Students, 7 to 8 o'clock, and 8 to 9 o'clock, Friday evenings.

Hours, Third Year Students, 7 to 9 o'clock.

Practical work, Monday, Tuesday, Thursday or Friday evenings, one evening only to each student.

Fee for this subject, \$2.50 per term.

Warp Preparation and Weaving.

Course of lectures on Warp Preparation and Weaving Machinery, as used for Cotton, Woolen and Worsted, also calculations and practical work. For subjects of lectures see previous page.

Hours, First Year Students, Lectures, 7 to 8 o'clock, and 8 to 9 o'clock, Thursday evenings.

Hours, Second Year Students, Lectures, 7 to 8 o'clock, and 8 to 9 o'clock, Friday evenings.

Hours, Third Year Students, Lectures, 7 to 8 o'clock, and 8 to 9 o'clock, Tuesday evenings.

Hours, practical work, Monday, Tuesday, Thursday or Friday evenings.

Fee for this group of subjects, \$2.50 per term.

Evening Design.

Monday, First Year Students, Lecture and practical designing.

Tuesday, Second Year Students, Lecture and practical designing.

Friday, Third Year Students, Lecture and practical designing.

Hours, 7 to 9 o'clock.

Thursday, Third Year Students, Cloth Analysis and practical designing.

Monday, Second Year Students, Cloth Analysis and practical designing.

Tuesday, First Year Students, Cloth Analysis and practical designing.

Friday, hand loom practice, First and Second Year Students.

Hours, 7 to 9 o'clock.

Chemistry and Dyeing.

Lessons on General Chemistry, including practical work.

Hours, First Year Students, Tuesday and Thursday evenings,
7 to 9 o'clock.

Fee for this subject, \$2.50 per term.

Full Course Textile and Dyeing Chemistry, including lectures
on practical work, Monday evening, from 7 to 9 o'clock.

This will be a first year course only.

Fee for this subject, \$5.00.

Women's Department.

Classes in Textile Designing are held Monday afternoons from
2.30 to 4.30 p. m., and Friday afternoons 2.30 to 4.30 p. m.

Fee, \$5.00 per term.

Freehand and other drawing classes will be arranged as
named elsewhere.



Free Popular Lectures.

A course of free popular lectures will be arranged for the season 1898 and 1899, and these will be delivered in the hall of the School at intervals of about four weeks.

Subject and date of lectures to be announced later.

The following lectures were delivered during the last season.
Opening address:

Oct. 4, 1897. — Mr. C. J. H. Woodbury, A. M., Secretary N. E. Cotton Manufacturers Association.

Oct. 26, 1897. — Mr. Frederick T. Walsh, Agent of the Lowell Bleachery. Subject, On the Bleaching of Textiles.

Nov. 12, 1897. — Mr. W. G. Nichols, Superintendent of the Lancaster Mills, Clinton, Mass. Subject, On the Manufacture of Gingham.

Nov. 30, 1897. — Mr. V. I. Cumnock, Superintendent of the Boott Mills, Lowell, Mass. Subject, On Textile Designing.

Dec. 16, 1897. — Prof. C. P. Brooks, Director of the Lowell Textile School, Lowell, Mass. Subject, On Cotton Cultivation.

Jan. 6, 1898. — Mr. W. P. Atwood, of the Hamilton Manufacturing Co., Lowell, Mass. Subject, On Dyeing of Textiles.

Feb. 11, 1898. — Prof. Fenwick Umpleby, Lowell Textile School, Instructor in Textile Design and Fabric Structure. Subject, Color and Woven Design.

Feb. 28, 1898. — Mr. Edward Atkinson, President Boston Manufacturers Mutual Fire Insurance Co. Subject, Fire Prevention in Textile Factories.

March 25, 1898. — Hon. N. P. Frye, North Andover, Mass. Subject, Woolen Machinery.

Lectures on Patent Law will be added during the coming season.

Register of Students, 1897-98.

Diploma Students.

SECOND YEAR CLASS, (1899.)

Cotton Manufacturing Course.

NAME.	HOME ADDRESS.
Bailey, J. W.	Waltham.
Bissell, W. E.	Lowell.
Carter, E. E.	Lowell.
Harmon, C. F.	Lowell.
Marshall, G. A.	Fitchburg.
Smith, A. A.	Lowell.

Woolen Manufacturing Course.

Cuttle, J. H.	Lowell.
Fels, A. B.	Lowell.
Gilman, G. W.	Lowell.
Tilton, E. T.	Lowell.

Designing Course.

Fitts, J. A.	Rochdale.
Gerrish, Walter	Lowell.
Moss, C. P.	Manchester, N. H.

FIRST YEAR CLASS, (1900.)

Cotton Manufacturing Course.

NAME.	HOME ADDRESS.
Atkins, L. A.	Lynn.
Baker, J. G.	Plainville, Conn.
Bolger, J. C.	Fall River, Mass.
Barr, I. W.	Lowell.
Cole, W. B.	Rockingham, N. C.
Dadmun, W. R.	Worcester, Mass.
Fiske, S. G.	Hingham, Mass.
Guild, W. H.	Manchester, N. H.
Hartshorn, L.	Greenville, N. H.
Lamson, G. F.	Lowell.
Mann, A. M.	Jamaica Plain.
McAlister, J. W.	Asheboro, N. C.
Ramsdell, A. R.	Andover, Mass.
Reed, G. E.	Lowell.
Soderberg, C. E.	Chelmsford.
Spain, J. W.	Quitucan, Ga.
Stewart, S.	Lewiston, Me.
Smith, S. E.	Methuen.
Stimpson, R. W.	Lowell.
Syme, J. F.	Worcester, Mass.
White, W. D.	Worcester, Mass.

Woolen Manufacturing Course.

Brickett, C. J.	Haverhill.
Bodwell, H. R.	Andover.
Hays, B.	No. Andover.
Leach, H. K.	Gilbertville.
Levey, G.	Ludlow, Vt.
Pearce, F. H.	W. Fitchburg.
Stitt, H. I.	Youngstown, Ohio.
Stewart, A.	Beauharnois, Canada.

Designing Course.

NAME.	HOME ADDRESS.
Adams, L. T.	Lowell.
Hanley, C. F.	Worcester, Mass.
Perkins, J. E.	Pittsfield, Mass.
Pradel, A. J.	Collinsville.
Trull, J. C.	No. Tewksbury.
Wing, C. T.	Lowell.

Dyeing Course.

Pohlman, G. C.	Fitchburg.
Sleeper, R. R.	Lowell.
Thompson, H. J.	Lawrence.

Decorative Art Course and Women's Department of Textile Design.

Burchard, V., Miss	Lowell.
Burrage, K., Miss	Lowell.
Campbell, L. E., Miss	Lowell.
Chase, E. D.	Lowell.
Dalton, G. G., Miss	Salem.
Goodhue, A. H., Miss	Dracut.
Hines, N. P., Miss	Lowell.
Lyon, G. A.	Lowell.
Merchant, E. C., Miss	Lowell.
Towle, J., Miss	Lowell.
Woodies, I. A., Miss	Lowell.

Special Courses.

Bean, J. W.	Lewiston, Me.
Colony, H. W.	Keene, N. H.
Draper, S. P.	Boston.
Hastings, W. M.	West Newton, Mass.
Hooker, S. A.	Cincinnati, O.

NAME.	HOME ADDRESS.
Reed, G. E.	Lowell.
Wainwright, C. W.	Stonewall, Miss.
Mitchell, T. E.	Mobile, Ala.
Murphy, E. M.	Lowell, Mass.
Leach, J. P., Jr.	Littleton, N. C.

STUDENTS 1897-1898 ACCORDING TO STATES.

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Vermont	1
Rhode Island	1
Connecticut	1
Canada	1
Georgia	1
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Mississippi	1
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New York	1
Alabama	1
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Graduates of High Schools	32
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Evening Students, 1897 and 1898.

Abbott, P. E., 1358 Middlesex St., Lowell, Mass.
Barstow, F. G., Methuen, Mass.
Brooks, N., 28 Anderson St., Lowell, Mass.
Berry, F. M., 419 Lincoln St., Lowell, Mass.
Brown F. P., 172 Grand St., Lowell, Mass.
Benner, E. W., 82 Third St., Lowell, Mass.
Bevington, J. H., 80 Butler St., Lawrence, Mass.
Barlow, R. H., 274 Methuen St., Lawrence, Mass.
Barlow, J., 274 Methuen St., Lawrence, Mass.
Bramhall, F. E., 84 Tenth St., Lowell, Mass.
Billings, V. W., 30 Eliot St., Lowell, Mass.
Booth, J. W., 25 Arlington Mills, Lawrence, Mass.
Boardman, A., 18 Hurd St., Lowell, Mass.
Binns, H., 47 Shaw St., Lowell, Mass.
Broadbent, C. J., 31 Park St., Lawrence, Mass.
Broadbent, J. T., 331 Lawrence St., Lowell, Mass.
Burkhardt, Wm., 82 Exchange St., Lawrence, Mass.
Blake, Charles L., 66 Kirk St., Lowell, Mass.
Crowell, E. E., 46 Bowditch St., Lowell, Mass.
Collier, J., Dracut, Mass.
Cullinan, M. H., 111 So Highland St., Lowell, Mass.
Cuttle, F. G., 309 Westford St., Lowell, Mass.
Comber, J. H., 23 Dutton St., Lowell, Mass.
Collins, W. H., 8 Grove St., Lowell, Mass. ♀
Court, O. A., 9 Alder St., Lowell, Mass.
Campbell, G. M., 105 Paige St., Lowell, Mass.
Claus, E. F., 38 Worthen St., Lowell, Mass.
Carden, F. T., 137 Parker St., Lawrence, Mass.
Carden, R., 137 Parker St., Lawrence, Mass.

Crompton, H. H., 54 Tenny St., Methuen, Mass.
Campbell, J. J., No. Billerica, Mass.
Campbell, A. D., 13 Broadway, Methuen, Mass.
Coburn, W. S., 14 Wannalancit St., Lowell, Mass.
Dane, Fred., No. Billerica, Mass.
Dickinson, J., 597 Broadway, Lawrence, Mass.
Dabney, W. L., 66 Kirk St., Lowell, Mass.
Duncklee, H. S., Brighton, Mass.
Day, A. B., 64 Thirteenth St., Lowell, Mass.
Donnelly, J., 196 Tremont St., Lowell, Mass.
Dover, G., 89 Arlington St., Lawrence, Mass.
Edgell, W. B., 117 Andover St., Lowell, Mass.
Ellis, H. B., No. Billerica, Mass.
Elston, Fred., 65 Center St., Methuen, Mass.
Frame, Wm., Lowell, Mass.
Farley, G. A., 74 Trenton St., Lowell, Mass.
Farrell, P. F., 193 Tremont St., Lowell, Mass.
Flather, F. A., 50 Chelmsford St., Lowell, Mass.
Friberg, E. G., 47 Agawam St., Lowell, Mass.
Gaudlitz, P., 52 Exchange St., Lawrence, Mass.
Geary, J. W., 27 Whipple St., Lowell, Mass.
Green, A. H., 157 Dartmouth St., Lowell, Mass.
Gagan, J. H., 205 Church St., Lowell, Mass.
Gaunt, A. C., 43 Pleasant St., Methuen, Mass.
Haslam, J., No. Billerica, Mass.
Holgate, Chas., 208 Moore St., Lowell, Mass.
Harding, F., 127 West St., Lawrence, Mass.
Hill, E. F., 55 Washington St., Lawrence, Mass.
Holgate, T., 262 Jackson St., Lawrence, Mass.
Homer, Wm., 17 Camden St., Lawrence, Mass.
Homer, G. G., 68 Gates St., Lowell, Mass.
Howarth, C. A., 32 Prospect St., Lowell, Mass.
Howarth, J. L., 38 Prospect St., Lowell, Mass.
Hamilton, C., 33 Methuen St., Lowell, Mass.

Hanson, Ed., 105 Paige St., Lowell, Mass.
Hart, G. H., 1375 Middlesex St., Lowell, Mass.
Hazling, H. F., 58 E. Merrimack St., Lowell, Mass.
Hartt, Frank H., 22 Boott Corporation, Lowell, Mass.
Hatch, A. L., 32 Second St., Lowell, Mass.
Howard, J., 16 Sydney St., Lowell, Mass.
Hutton, C., 98 Humphrey St., Lowell, Mass.
Hutton, R., 98 Humphrey St., Lowell, Mass.
Hamblett, H. A., Dracut, Mass.
Hays, B., Andover, Mass.
Harris, W. O., 12 Broadway, Lowell, Mass.
Johnson, Jabez, 39 Paige St., Lowell, Mass.
Johnson, Brent, 32 Dover St., Lowell, Mass.
Kelly, A. J., 127 Grove St., Lowell, Mass.
Kellett, I., 96 Trenton St., Lowell, Mass.
Knowles, F. E., 32 Dutton St., Lowell, Mass.
Kitchen, A. B., Dracut, Mass.
Kelley, J. F., 80 Fourth Ave., Lowell, Mass.
Knowlton, W. B., 95 Harvard St., Lowell, Mass.
Knapton, B., 146 Chelmsford St., Lowell, Mass.
Knapton, S., 146 Chelmsford St., Lowell, Mass.
Latham, J., Jr., North Billerica, Mass.
Lacey, W. H., 137 Abbott St., Lawrence, Mass.
Lyon, G. A., Lowell, Mass.
Livingston, H. R., 287 Westford St., Lowell, Mass.
Marshall, J. A., 6 Lake St., Lawrence, Mass.
Marjerison, I. D., 32 Washington St., Lawrence, Mass.
McDavitt, Wm. L., 88 Cross St., Lawrence, Mass.
Morgan, Wm., 66 Kirk St., Lowell, Mass.
Mungall, Arthur, 630 Merrimack St., Lowell, Mass.
Mackay, R. N., 48 Franklin St., Lowell, Mass.
McArthur, Wm., Dracut, Mass.
Murdy, Wm., 261 Concord St., Lowell, Mass.
Midgley, Craven, 169 Meadowcroft St., Lowell, Mass.

Moir, A. L., 151 West Sixth St., Lowell, Mass.
 Murkland, P. N., 313 High St., Lowell, Mass.
 Nugent, T. A., 4 Rockdale Ave., Lowell, Mass.
 Newell, H. A., 57 Hancock St., Lowell, Mass.
 Needham, J. W., 20 Boott Corporation, Lowell, Mass.
 Norton, J. J., 108 Bunker Hill St., Lawrence, Mass.
 Noble, J. T., 4 Carter Place, Lowell, Mass.
 Norris, Katharine, 46 Boott Corporation, Lowell, Mass.
 Ormerod, Oliver, North Billerica, Mass.
 Ormerod, Harry, North Billerica, Mass.
 Osgood, C. H., 118 Riverside St., Lowell, Mass.
 Osgood, C. F., 201 School St., Lowell, Mass.
 Perry, G. H., North Billerica, Mass.
 Pickering, H. E., Andover St., No. Tewksbury, Mass.
 Potts, J. H., North Billerica, Mass.
 Perham, R. H., 19 Wannalancit St., Lowell, Mass.
 Peacock, J. R., 457 Dutton St., Lowell, Mass.
 Pirotte, A. J., North Andover Depot, Mass.
 Peel, Hudson, 87 Tenny St., Methuen, Mass.
 Robinson, E., 18 Elm St., North Billerica, Mass.
 Reenstierna, T., 67 South Whipple St., Lowell, Mass.
 Richards, P. E., 4 Park St., Lowell, Mass.
 Robbins, F. F., 42 Storrow St., Lawrence, Mass.
 Reynolds, P. L., 716 Maple St., Fall River, Mass.
 Rooney, G. W., 14 Madison St., Lowell, Mass.
 Snow, F. L., 41 Hanover St., Lowell, Mass.
 Selfridge, H., 290 East Merrimack St., Lowell, Mass.
 Stevenson, Wm., North Billerica, Mass.
 Stopherd, Wm. H., 22 Cady St., Lowell, Mass.
 Smith, W. H., 18 Ashland Ave., Methuen, Mass.
 Searle, J. E., 305 Worthen St., Lowell, Mass.
 Smith, A. B., 176 Tremont St., Lowell, Mass.
 Sidebottom, J. W., 24 B St., Lowell, Mass.
 Shields, Andrew, 141 Parker St., South Lawrence, Mass.

Shaw, F. P., 86 Thorndike St., Lowell, Mass.
Seddon, N. H., 80 East Haverhill St., Lawrence, Mass.
Smith, B., 30 Chelmsford St., Lawrence, Mass.
Simonds, J. H., 220 Newbury St., Boston, Mass.
Shaw, E. T., 343 Wilder St., Lowell, Mass.
Swift, E. S., 276 Parkview Ave., Lowell, Mass.
Spedding, E. H., 161 Avon St., Lowell, Mass.
Saunders, E. B., 58 Methuen St., Lowell, Mass.
Smith, J., 43 Worthen St., Lowell, Mass.
Thornton, H., 142 Merrimack St., Lowell, Mass.
Tetley, J., Methuen, Mass.
Trow, R. W., Andover, Mass.
Tillson, H. E., 3 Prospect St., Lawrence, Mass.
Taylor, H., 27 Whitman St., Lawrence, Mass.
Umpleby, T. B., 83 Third St., Lowell, Mass.
Whitworth, J. W., 2 Doherty Court, Lowell, Mass.
Whitworth, E., 31 Sydney St., Lowell, Mass.
Warburton, J., Gorham St., Lowell, Mass.
Willman, A. E., 8 Hale St., Lowell, Mass.
Wood, J., 3 Tweed's Cottage, Lowell, Mass.
White, F. H., Moody House, Lowell, Mass.
Wilton, G. H., No. Andover, Mass.
Wilmot, W., 342 Lincoln St., Lowell, Mass.
Young, W. L., 1149 Middlesex St., Lowell, Mass.
Young, C. F., 280 East Merrimack St., Lowell, Mass.



Afternoon and Evening Students According to Occupation.

1 Apprentice.	1 Messenger.
1 Assistant Overseer.	1 Mule Spinner.
1 Assistant Superintendent.	7 Mill Operatives.
1 Beamer.	8 Not Known.
4 Book-keepers.	7 Overseers.
1 Calico Printer.	1 Pattern Cutter.
1 Carder.	1 Pin Setter.
1 Card Grinder.	1 Print Works.
14 Clerks.	1 Reed Finisher.
1 Cloth Stamper.	1 Roving Hand.
1 Cloth Inspector.	1 Roving Preparer.
2 Color Makers.	5 Second Hands.
1 Color Matcher.	10 Section Hands.
1 Cotton Waste Merchant.	2 Sketchmakers.
2 Designers.	2 Slasher Tenders.
8 Draughtsmen.	1 Spare Hand.
1 Drawing-fixer.	14 Spinners.
1 Drawer-in.	1 Store-keeper.
3 Drawing Carriers.	4 Students.
10 Dyers.	1 Superintendent.
1 Engraver.	4 Warp Dressers.
2 Finishers.	19 Weavers.
1 House-keeper.	1 Winder.
1 Learning Cotton Business.	2 Wool Combers.
6 Loom Fixers.	5 Wool Sorters.
18 Machinists.	1 Worsted Spinner.

Contributions or loans of machinery, apparatus or material, kindnesses extended or assistance rendered by the following firms or persons are acknowledged with thanks:—

Actien Gesellschaft für Anilin Fabrikaten, Berlin.
Altemus, W. W., Philadelphia, Pa.
American Card Clothing Co., Lowell, Mass.
American Drosophore Co., Boston, Mass.
Appleton Co., Lowell, Mass.
Arabol Mfg. Co., New York City.
Arlington Mills, Lawrence, Mass.
Atlas Mfg. Co., Newark, N. J.
Atwood Machine Co., Stonington, Conn.
Avery Chemical Co., Littleton, Mass.
Badische Anilin und Soda Fabrik, Germany.
Barbour Bros., Boston, Mass.
Bartlett & Dow, Lowell, Mass.
Beach & Co., Hartford, Conn.
Bennett, Frank P., Boston, Mass.
Berry, A. Hun, Boston, Mass.
Boott Mills, Lowell, Mass.
British Alizarin Co., England.
Capron, C. C., Uxbridge, Mass.
Carruthers, Robert, Lowell, Mass.
Carey, W. W., Lowell, Mass.
Clark, Jeremiah, Lowell, Mass.
Coats, J. & P., Pawtucket, R. I.
Coburn, C. B. & Co., Lowell, Mass.
Coburn Shuttle Co., Lowell, Mass.
Crompton-Knowles Loom Works, Worcester, Mass., and Providence, R. I.
Davis & Furber Machine Co., North Andover Depot, Mass.
Draper Co., Hopedale, Mass.

Entwistle, T. C., Lowell, Mass.
Emmons Loom Harness Co., Lawrence, Mass.
Farbenfabriken of Elberfeld Co., New York, N. Y.
Firth, Wm., Boston, Mass.
Furbush Machine Co., Philadelphia, Pa.
Gates, J. & Sons, Lowell, Mass.
General Fire Extinguisher Co., Providence, R. I.
Gilbert Manufacturing Co., Gilbertville, Mass.
Gilbert Loom Co., Worcester, Mass.
Hamilton Mills, Lowell, Mass.
Hamilton Print Works, Lowell, Mass.
Harwood, G. S. & Son, Boston, Mass.
Holyoke Machine Co., Worcester, Mass.
Howard Bros., Worcester, Mass.
Jacques Shuttle Co., Lowell, Mass.
Kalle & Co., New York, N. Y.
Kalle & Co., Boston, Mass.
Kittredge, H. G., Boston, Mass.
Kitson Machine Co., Lowell, Mass.
Knowles Loom Works, Worcester, Mass.
Laminar Fibre Co., Cambridge, Mass.
Lawrence Manufacturing Co., Lowell, Mass.
Leominster Woolen Co., Leominster, Mass.
Leopold, Cassella, Germany.
Leyland Belting Co., Lawrence, Mass.
Lowell Manufacturing Co., Lowell, Mass.
Lowell Machine Shop, Lowell, Mass.
Lyon, A. S., Lowell, Mass.
Massachusetts Co., Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Merrimack Co., Lowell, Mass.
Mather & Platt, England.
Mathieson, W. J. & Co., Boston, Mass.
Mauger & Avery, Boston, Mass.

Meister Lucius & Bruning, Germany.
Montgomery, J. R. Co., Windsor, Conn.
Nat. Assn. of Wool Mfrs., Boston, Mass.
N. E. Cotton Mfrs. Assn., Boston, Mass.
New York & Boston Dyewood Co., Boston, Mass.
Olney Bros., Providence, R. I.
Parker, W. H. & Sons, Lowell, Mass.
Pickhardt & Kuttroff, Boston, Mass.
Prince, Smith & Son, Keighley, Eng.
Read, Holliday & Co., Boston, Mass.
Roy, B. S., Worcester, Mass.
Roessler & Hasslacher Chemical Co., New York.
Sargent Sons, C. G., Graniteville, Mass.
Schoelkopp Aniline & Chemical Co., Buffalo, N. Y.
Star Worsted Co., Fitchburg, Mass.
Stevens, M. T. & Sons, No. Andover, Mass.
Stirling Mills, Lowell, Mass.
Stoddard, Haserick & Richards, Boston, Mass.
Sullivan Machinery Co., Claremont, N. H.
Talbot Mills, North Billerica, Mass.
Talbot Dyewood and Chemical Co., Lowell, Mass.
Tillinghast, Stiles & Co., Providence, R. I.
Torrance Mfg. Co., Harrison, N. J.
Thompson Hardware Co., Lowell, Mass.
Tremont & Suffolk Mills, Lowell, Mass.
Union Shuttle Co., Lawrence, Mass.
United States Aerophor Air Moistening Co., Providence, R. I.
Victor, Koechl & Co., Boston, Mass.
Walsh, Thomas, Lowell, Mass.
Wattles, L. R., Canton Junction, Mass.
Whiting, Henry F., Lowell, Mass.
Whitin Machine Works, Whitinsville, Mass.
Whiteley, John & Son, Halifax, Eng.
Williams Roving Carrier Co., Naugatuck, Mass.

. . . The . . .
Lowell Textile School,
Lowell, Mass.



Catalogue
1899-1900.



TEXTILE
SCHOOL

VIEW OF SCHOOL FROM MIDDLE STREET

LOWELL TEXTILE SCHOOL
LOWELL, MASS.

Annual Catalogue
1899-1900.

Parker Block, Middle and Merrimack Streets.

PRINCIPAL ENTRANCE:
No. 128 Merrimack Street.

M. G. WIGHT & CO.,
LOWELL, MASS.

Trustees of the Lowell Textile School.

(INCORPORATED 1895.)

Officers 1899-1900.

A. G. CUMNOCK, PRESIDENT.

A. G. POLLARD, TREASURER.

JAMES T. SMITH, CLERK.

Honorary Trustee.

AUGUSTUS LOWELL.

Trustees.

On the part of the Commonwealth of Massachusetts.

HOWARD STOCKTON.

A. S. COVEL.

Trustees Ex-Officio,

HON. JEREMIAH CROWLEY,

A. K. WHITCOMB,

Mayor of Lowell,

Supt. of Schools, Lowell.

Trustees.

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J. W. C. PICKERING.

FREDERICK E. CLARKE.

EDW. D. HOLDEN.

JOSEPH L. CHALIFOUX.

WM. M. WOOD.

Calendar.

1899.

Entrance examinations for day students, Thursday, Sept. 28, at 10
A. M.

Entrance examinations for evening students. Thursday, Sept. 28,
at 7 P. M.

School year begins (day) Tuesday. Oct. 3.

Evening school year begins Monday, Oct. 16.

1900.

Semi-annual examinations begin Wednesday, January 24.

Second term begins Tuesday, February 6.

Annual examinations begin Wednesday, May 23.

Diplomas awarded Wednesday, June 6.

First entrance examinations Thursday, June 7, at 10 A. M.



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COTTON, CARDING AND DRAWING

The Lowell Textile School.

The establishing of a school at Lowell for thorough instruction in the theory and practical art of manufacturing all fibers known to the textile industry, although proposed early in 1891, was not determined upon until the organization, methods and scope of such foreign schools, especially in England, France, Switzerland, Germany and Russia, had been carefully studied, and their permanence and value to the textile interests of those countries made clearly apparent.

The success attending the Textile Department of the School of Industrial Art at Philadelphia, and the benefits derived by the industry from the Lowell School of Applied Design, founded and maintained at Boston by Augustus Lowell, Esq., left no room for doubt that American conditions were favorable to the establishment of, in fact imperatively demanded, a textile school here.

The "Trustees of the Lowell Textile School" are incorporated under a special act of the Massachusetts Legislature, "for the purpose of establishing and maintaining a Textile school for instruction in the theory and practical art of textile and kindred branches of industry."

The incorporators are representatives either as president, treasurer, agent or superintendent, of the management of the great textile corporations of Lowell, Lawrence and vicinity in the Merrimack Valley with an aggregate capital of over \$25,000,000. By the terms of the By-Laws, at least three-fourths of the Trustees must be "persons actually engaged in or connected with textile or kindred manufactures." This insures the practical character of the management and instruction.

The School is located at Lowell, Massachusetts, the "Mother Textile City of America" the city and state affording financial aid

and the manufacturers of New England being equally liberal in contributions. The advantages of the location at a textile centre where every commercial fibre enters into the products, the student thus being directly in touch with the textile industry and the management thereof, will be apparent.

The School was formally opened by His Excellency Gov. Wolcott on January 30, 1897, in the presence of a large gathering of gentlemen interested in textile industries from all parts of New England. Instruction was commenced on February 1, 1897, the number of students exceeding the most sanguine expectations.



The Work of the School.

The principles of science and art are taught, not with the object of educating professional scientific men, but with a view to industrial and commercial applications; but the School offers to graduates of universities and scientific institutions the advantage of technical instruction in the practical application of certain sciences. It also offers special facilities to those entering commercial life for obtaining such knowledge of the construction of textile fabric and of the languages of foreign commerce as is essential in the marketing of goods abroad.

The equipment of the School consists of high grade machinery with all latest improvements, specially built to afford facilities for all kinds of experimental work, and of such variety as is never found in any one textile mill. With all the machinery that is already installed, the school has a more extensive equipment than any other existing textile school either in America or Europe.

The staff of lecturers and instructors includes gentlemen from the leading scientific and art institutes of Europe and America, and also those who have had special experience in textile school work and in the various processes of textile manufacture, it having been from the first the purpose of the management to furnish as thorough scientific instructors in textile and textile machine manufacture as is furnished by any Technological Institution in the branches of industry to which it relates.

Day Classes.

These are especially intended for the instruction of young men whose intention it is to enter the business of textile manufacturing in any branch. The courses are sufficiently complete to enable one to start without any previous acquaintance with textiles; but at the same time those who have been engaged in such business and wishing to improve their knowledge and opportunities, are able to devote their entire time to study, can do so most profitably.

The complete collection of machinery enables every process to be practically illustrated.

The student has the option of selecting any one of four courses.

Each course is intended to cover three years. It is optional whether or not a student continues the full course of three years, but this is strongly recommended.

There will be *one term* of preliminary instruction, which will be common to all courses. At the end of this term, each student will be required to select which of the four courses he will follow in his subsequent studies, and the instruction to be given after the first term of the first year will be specialized to suit each course.

The four regular courses are:

- I. Cotton Manufacturing.
- II. Wool Manufacturing.
- III. Designing. General Course.
- IV. Chemistry and Dyeing.

Evening Classes.

The second branch of the School work is intended to give thorough evening instruction to those who are engaged during the day in mills and work shops, to enable those who wish it to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they are regularly engaged, and in the course of several winters to complete a thorough technical education without interfering with their daily duties.

Evening students have the option of entering for one or more of five different courses, and arrangements will be made as far as possible for them to take such a section of each course as is suitable to the student's daily occupation in the mill.

1st. Cotton picking, carding, combing, drawing and spinning, with calculations connected with same, including practical work on the machines referred to.

2nd. Woolen carding, spinning; worsted carding, combing, drawing and spinning; woolen and worsted twisting, including practical work on the machinery and calculations connected with same.





COTTON COMB AND RAILWAY HEAD

3rd. Designing and cloth construction in all materials, cloth analysis and reproduction, color in textiles and textile calculations.

4th. Chemistry and dyeing.

5th. Weaving on all varieties of looms; cotton, woolen and worsted, including warp preparation, practical work on the machines and textile calculations.

Each of the above departments is covered by a three years' course.

It is aimed to make the instruction as thorough and practical as possible. Lectures are given illustrative of the machinery and processes under consideration and timed to correspond with practical work on the same machinery and processes.

In general it is possible to take up the study of two of the above evening courses concurrently.

The time devoted to practical work both day and evening is considerably longer than that devoted to lectures, and in order to make the instruction real and thorough, no student is allowed to pass to another machine or process until he becomes thoroughly acquainted with the one on which he is engaged.

Women's Department.

Among the many fields in which woman has entered, none has been found in which her natural refinements of taste and skill can be used to better advantage than in designing; but natural ability though the prime requisite, is by no means all, for a certain amount of technical knowledge must be gained to achieve success. This department combines decorative art and textile design, and in general requires attendance on four afternoons per week.

Commercial Department.

A special course in textile construction and foreign languages is arranged for those contemplating a commercial career.

All such are invited to communicate with the Principal.

Buildings and Equipment.

The building in which the school is situated is particularly well adapted to its present use; it is of modern slow burning mill construction, equipped with freight and passenger elevators, steam heat, gas and electricity, the latter for both power and light. Each room is protected against fire by sprinklers and thermostats, and self closing fire doors are provided. The humidifiers, motors, shafting, belting, etc., are installed in a most modern manner throughout.

The equipment of machinery is arranged so as to be the most complete of its kind in the world for textile educational purposes; the machinery and plant already in place is of a value of \$80,000, and is such as to enable raw cotton or wool to be treated in the school at every process until it becomes a woven fabric.

The equipment of the Cotton Department includes:—

One Automatic Feeder made by the Kitson Machine Co., Lowell, Mass.

One Single Beater Breaker, made by the Kitson Machine Co., Lowell, Mass.

One Single Beater Finisher made by the Kitson Machine Co., Lowell, Mass.

One Top Flat Card, made by the Lowell Machine Shop, Lowell, Mass.

One Revolving Flat Card, made by the Lowell Machine Shop, Lowell, Mass.

Card Grinding Rolls, Stripping Rolls, etc.

One Sliver Lap Machine, made by the Mason Machine Works, Taunton, Mass.

One Ribbon Lapper, made by the Mason Machine Works, Taunton, Mass.

One Comb made by the Mason Machine Works, Taunton, Mass.

One Railway Head, made by the Lowell Machine Shop, Lowell Mass.

One Drawing Frame, made by the Lowell Machine Shop. Lowell, Mass.

One Slubber, made by the Lowell Machine Shop, Lowell, Mass.

One Intermediate made by the Lowell Machine Shop. Lowell, Mass.

One Fine Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Ring Spinning Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Spinning Mule, made by the Lowell Machine Shop, Lowell, Mass.

One Spooler, made by the Lowell Machine Shop, Lowell, Mass.

Wet and Dry Twister, made by the Draper Co., Hopedale, Mass.

One Reel, made by the Whitin Machine Works, Whitinsville, Mass.

The Spinning Department includes:—

One Parkhurst Burr Picker, made by the Atlas Mfg. Co., Newark, N. J.

One Mixing Picker, made by the Davis & Furber Machine Co., North Andover, Mass.

One set of three Woolen Cards, including:—

First Breaker, with Bramwell Feeder, made by Davis & Furber Machine Co., North Andover, Mass.

Second Breaker, made by the Davis & Furber Machine Co., North Andover, Mass.

Finisher, made by the Davis & Furber Machine Co., North Andover, Mass.

One Improved Breaker Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Bramwell First Breaker Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Torrance Balling Head and Creel, made by the Torrance Mfg. Co. Harrison, N. J.

Apperly Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Spinning Mule, 120 spindles, made by the Davis & Furber Machine Co., North Andover, Mass.

One Twister, made by the Davis & Furber Machine Co., North Andover, Mass.

The Worsted Spinning Department includes :

One 50-inch Double Worsted Card (4 lickerin), made by the Davis & Furber Machine Co., North Andover, Mass., and the following made by Prince, Smith & Son, Keighley, England:—

One Revolving Creel for 12 Balls.

One Double Head Can Gill Box.

One 2 Spindle Gill Box.

One 2 Spindle Drawing Box.

One 2 Spindle Weigh Box.

One 4 Spindle Finisher.

One 12 Spindle Dandy Rover.

One 12 Spindle Cap Spinner.

One 12 Spindle Flyer Spinner.

One 12 Spindle Ring Spinner.

One 12 Spindle 2 Fold Cap Twister.

One 12 Spindle 6 Fold Ring Twister.

From Hall & Stell, Keighley, England :—

One gill box before combing.

One gill box after combing.

One Noble Worsted Comb, from Crompton & Knowles, Worcester.

One Balling Box, from same firm.

The Cotton Warp Preparation Department consists of :—

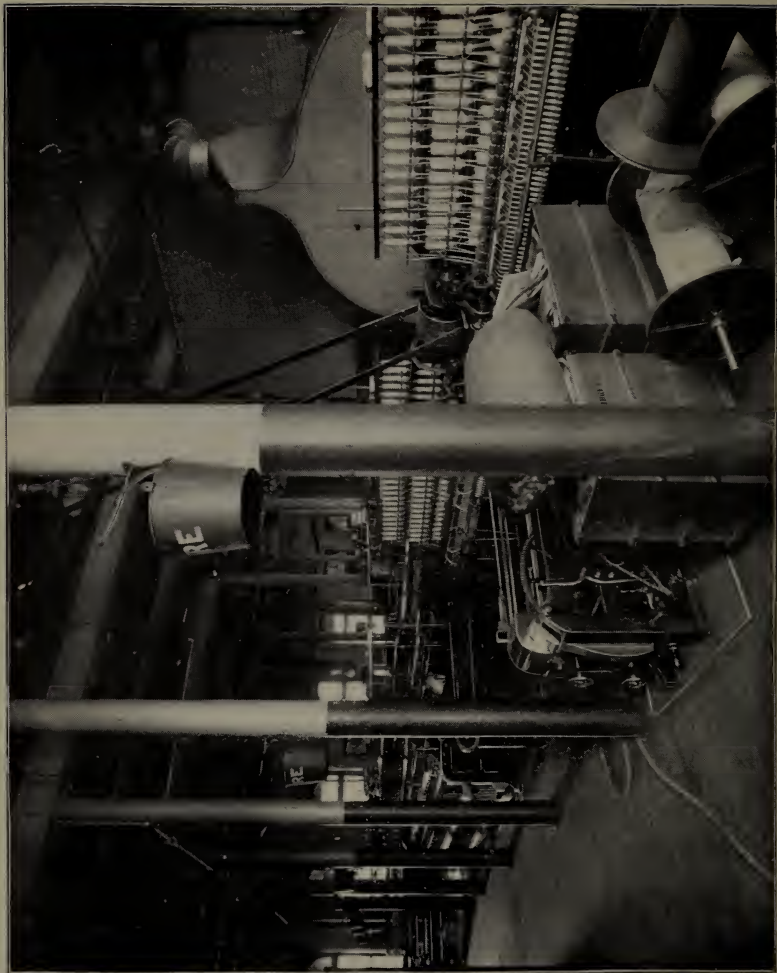
One Spooler, made by the Lowell Machine Shop, Lowell, Mass.

One Warper, made by the Lowell Machine Shop, Lowell, Mass.

One Slasher, made by the Lowell Machine Shop, Lowell, Mass.

One Béamer, made by Mr. T. C. Entwistle, Lowell, Mass.

Drawing-in Frames, etc.



COTTON MULE AND SLASHER

The Woolen and Worsted Warp Preparation Department consists of:—

One Warp Spooler, made by the Davis & Furber Machine Co., North Andover, Mass.

One Dresser, made by the Davis & Furber Machine Co., North Andover, Mass.

One Reel, made by the Davis & Furber Machine Co., North Andover, Mass.

One Beamer, made by the Davis & Furber Machine Co., North Andover, Mass.

One 48 Spool Creel made by Davis & Furber Machine Co., North Andover, Mass.

Also a number of hand warping and beaming frames.

The Weaving Department which is the most complete in the world, with regard to the variety of looms, consists of:—

One Plain Northrop Loom, made by the Draper Co., Hopedale, Mass.

One Plain Print Cloth Loom, made by Whitin Machine Works, Whitinsville, Mass.

One Side Cam Twill Loom, made by the Whitin Machine Works, Whitinsville, Mass.

One Five Harness Heavy Loom, made by the Lowell Machine Shop, Lowell, Mass.

One Plain Print Cloth Loom, made by the Mason Machine Works, Taunton, Mass.

And the following looms, made by the Crompton Knowles Loom Works, Worcester, Mass., and Providence, R. I.:—

One Knowles Gingham Loom, 4 boxes.

One Knowles Fancy Cotton Loom, with 20 harness dobby, 4 boxes.

One Knowles Fancy Cotton Loom, with 25 harness dobby.

One Knowles Blanket Loom, with 25 harness dobby, 4 boxes.

One Knowles Gem Loom 20 harness, 4 x 4 boxes.

One Knowles Worsted Loom, 32 harness.

One Knowles Fancy Loom, with single lift jacquard.

One Knowles Fancy Loom, with double lift jacquard.
One Knowles Fancy Loom. with jacquard tied up for leno.
One Knowles Ingrain Carpet Loom, 4 x 4 boxes.
One Crompton Gingham Loom, 4 boxes.
One Crompton Fancy Loom, 6 x 1, with double cylinder 20 horse
doby.

One Crompton Fancy Cotton Loom with single cylinder 20 harness dobbie.

One Crompton Jean Loom.

One Crompton Lappet Loom, with 16 harness dobbie.

One Crompton Towel Loom.

One Crompton Ingrain Carpet Loom, 4 x 4 boxes.

One Crompton Worsted Loom, 27 harness.

There are also the following hand Looms, viz.:—

Twelve Hand Looms, 2 x 3 boxes, with 20 harness dobbie.

Eight Hand Looms, 4 x 4 boxes, with 24 harness dobbie.

Six Hand Looms. 3 x 3 boxes, with 32 harness dobbie,

Six Hand Looms. 4 x 4 boxes, with 30 harness dobbie,

Two Hand Looms, with treadles.

Two Hand Looms, 4 x 4 boxes, with 200 hook jacquard.

Two Hand Looms, 3 x 3 boxes, with 200 hook jacquard

Two Hand Looms, 3 x 3 boxes, with 600 hook jacquard.

One Jacquard piano card cutting machine, from John Royle & Sons, Paterson, N. J.

The Silk Machinery consists of:—

One Winder. made by the Atwood Machine Co., Stonington, Conn.

One Quiller, made by the Atwood Machine Co., Stonington, Conn.

One Warper, made by the Atwood Machine Co., Stonington, Conn.

One Beamer, made by the Atwood Machine Co., Stonington, Conn.

One Doubling Frame, made by the Atwood Machine Co., Stonington. Conn

Motive Power, etc.

One 30 horse-power Motor, by the General Electric Co., Schenectady, N. Y.

Two 20 horse-power Motors, made by the Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa.

One 2 horse-power motor.

One 1 horse-power motor.

One 1-8 horse-power motor.

One complete system of fire protection, including sprinklers, air pressure system, thermostats, and other appliances, by the General Fire Extinguisher Co., Providence, R. I.

One complete humidifying plant, by the American Drosophore Co., Boston, Mass.

One Complete humidifying plant by the U. S. Aerophor Air Moistening and Ventilating Co., Providence, R. I.

The Dyeing Department is fully equipped with complete chemical laboratory with individual benches, also small machines for dyeing, and other processes.

Calico Printing Machine, made by Mather & Platt, Oldham, England.

One hydro-extractor, from W. H. Tolhurst & Sons, Troy, N. Y.

The School is well equipped with reels, testers and scientific instruments for experimental purposes.



Day Students.

Entrance Qualifications.

Candidates for admission to the day classes may present to the Principal such evidence as may be obtainable, whether degree, diploma or certificate, at any time. For all others, there will be held examinations, as stated in calendar; candidates failing to pass at June examinations will be allowed to try again in September; those who cannot attend the June examinations, may present themselves in September; if conditioned, a further examination will be appointed. Preparation in general will be as follows :

Arithmetic.

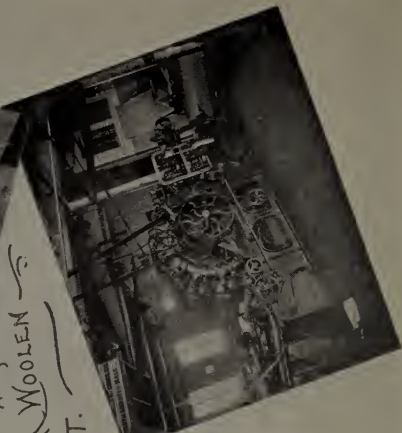
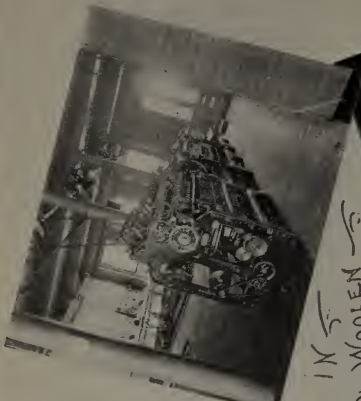
Definitions; elementary operations of addition, subtraction, multiplication and division; squares; cubes; square-root; interest; discount; fractions, simple and complex; decimals; percentage; ratio and proportion.

English.

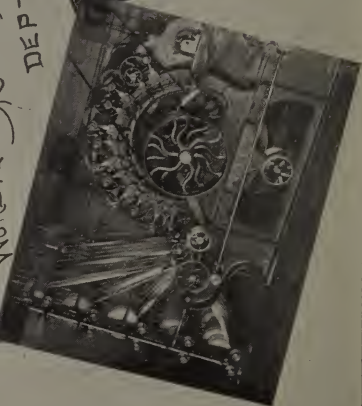
The candidates will be expected to correct examples of bad English, both for spelling, punctuation, capitalization, grammar and sense; also to write a short composition on a given theme (some familiar one), to show a knowledge of language and method of expression.

Geography.

Location of principal countries, with capitals, large rivers, mountains, etc.; noting characteristics of climate and inhabitants. General statements rather than specialization will be sought.



VIEWS IN
WORSTED AND WOOLEN
DEPT.



Algebra.

(During 1899 this subject will not be required for entrance, provision being made for it during the first term; but it will doubtless be asked for subsequently.)

Definitions; fundamental operations; parentheses; factoring; highest common factor; least common multiple; fractions, simple and complex; simple equations, one or more unknown quantities; involution and evolution; square and cube root; logarithms.



PREPARATORY SCHOOLS.

For those who intend to take Chemistry and Dyeing, physics is almost indispensable; and while the preparation afforded by the modern grammar school will enable the student to complete either of the courses at this school, the increased advantages of the equivalent of a high school training cannot be over-estimated. In such a preparatory course particular attention should be given to algebra, geometry, manual training, chemistry, physics (including mechanics, heat, light, sound and electricity), French and German.

Optional Courses.

During the present year optional courses are offered in advanced algebra, German, Spanish, and French at the school; and such other courses as may be demanded will be added from time to time.

Advanced Standing.

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular courses may present themselves for examination in such a subject on Friday, September 29, 1899. If a satisfactory rank be attained, they will be given such further work as will be best suited to their advancement,

Fees.

The fee for the day course is \$100 per year for residents of Massachusetts; for non-residents it is \$150 per year.

Five-eighths is payable on or before Oct. 10, the balance on or before Feb. 10, of each year. After payment is made no fee or part thereof can be returned.

Special students pay, in general, the full fee; but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, overalls, etc., and pay for any breakage or damage that they cause. The above fee includes free admission to any of the evening classes in which there is accommodation should any day student desire to attend.

The fees for the evening classes vary and are indicated elsewhere.

Fees are strictly payable in advance and no student will be admitted to the classes until his fees are paid and he has filed an attendance card.

Examinations.

Examinations will be held at the end of each term.

Students who do not show sufficiently satisfactory progress in the final examinations at the end of the first year will not be admitted to the second years classes, and the same applies to second year students, with reference to their admission to the third year class.

Intermediate examinations will be held, which will serve to inform the student as to progress made or lack of it, and may be appointed at any time.

In general the examinations will cover the work of the preceding term but at the end of the third year, candidates for the diploma may be examined on all preceding work.

Daily work and regularity of attendance will also be considered in making up the reports of standing.

Reports of Standing.

Twice during each term informal reports are sent to students, or guardians of such as are not of age; and at the end of each term formal reports are made.

Attendance Card.

At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as he may choose, subject to the approval

of the Principal. When an attendance card is once approved no change can be made except through the Principal.

Thesis

All candidates for the diploma of the school, must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper 8 x 10, with 1 inch margin at left and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete either of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged for.

Diploma

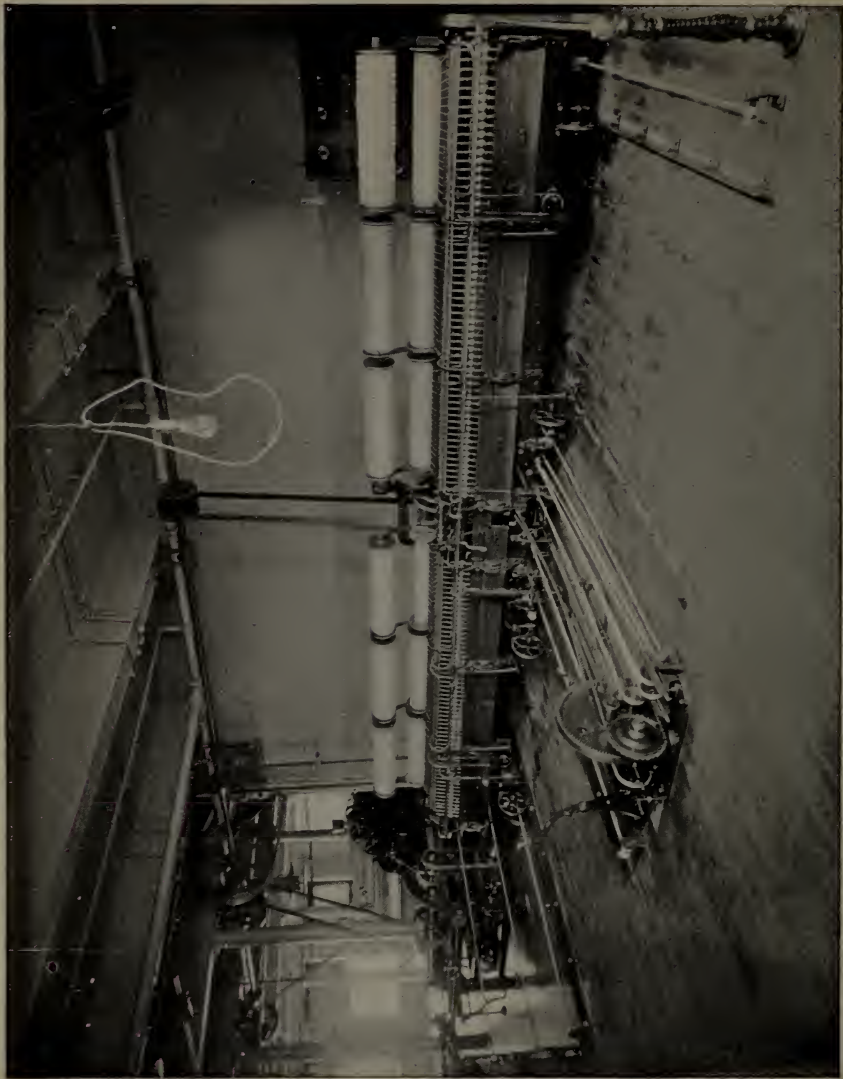
The diploma of the School is awarded upon the satisfactory completion of either of the four regular courses, covering not less than three years except where entrance is to advanced standing. In such cases at least one year's residence will be required.

Certificate

For the satisfactory completion of a three year's course in any special department, the certificate of the school will be awarded; but at least one year's attendance will be required, if the candidate be passed to advanced standing.

Payments

All payments should be made to Wm. W. Crosby, Principal. If by check, remittance from points outside of New England should be in Boston funds.



WOOLEN SPINNING DEPARTMENT

Conduct

Day students will be expected to attend all lectures, classes and demonstrations of practical work, except when permission to be absent has been obtained from the Principal. In case of sickness, or other unavoidable absence, written explanation must be sent. When specially required by parents, cases of absence will be reported daily.

Books will be prescribed for study and for entry of lecture notes and other exercises, and will be periodically examined by the lecturers. The care and accuracy with which these books are kept will be considered in awarding marks.

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order.

In the case of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct, or general insubordination, will be considered good and sufficient reasons for the suspension of a student by the Principal, and for his subsequent removal from the School and forfeiture of all school privileges, if the President of the School so decides.

Apparatus used in the Dyeing or Chemical Laboratory will be provided by the School, but a deposit must be made by the student at the beginning of the term sufficient to cover its cost, and this deposit will be returned to him at the close of the term, subject to such deduction as will reimburse the School for broken or damaged articles.

Library

The School Library is supplied with all the leading textile books and with works dealing with sciences, art or industries allied to the textile trades. The leading textile trade papers are kept on file.

Sessions

The regular school sessions will be in general from 9 A. M. till 1 P. M., and from 2.15 to 5 P. M., except Saturdays when the building will be closed in the afternoon.

A schedule will be prepared showing the time to be devoted to each subject and the hours at which the various classes meet. This will be rigidly adhered to and the register will be marked for each lecture or demonstration.

General

Students from a distance, requiring rooms and board in the city, may, if they desire it, select the same from a list of houses which is kept at the School. The cost of rooms and board in a good district is from \$4 per week upwards.

All raw stock and yarn will be provided by the School and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student will be allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated as prescribed by the Principal, and facilities will be given for the preparation of a collection of such fabrics as are produced in the School, with all instructions for their manufacture. It is understood that the Trustees may retain in the School such other specimens of students' work as the Principal may determine.

Prospective students who are desirous of arranging special courses by omitting a portion of one course, adding a portion of another, or in any other way, are invited to communicate with the Principal.

An additional entrance examination to suit the convenience of students from a distance (out of New England), will be arranged.

Lock boxes will be provided, free of charge, for the use of the students, sufficiently capacious to contain clothing, books and tools.

No books, instruments, or other property of the School will be

loaned to the students, or allowed to be removed from the premises.

Facilities will be given for visits by day students to New England mills and works during the session.

Materials

Students must purchase such tools, instruments, text books and apparatus as may from time to time be recommended by the head of each department, and the cost of these for day students will be from \$10.00 to \$15.00, and for evening students from \$2.00 upwards, according to the subject studied.

The Courses

The title of each of the four regular courses is an indication of the particular nature of the course unless it be in the case of Course III. There is a considerable demand for a general textile course in which the whole subject may be treated broadly; this course is organized with this particular object in view although various options are offered, in which some one branch may be followed at length.

Certain general studies are included in each course in order that in specializing, a too narrow view may be avoided; for in this branch of the world's industries, there have been too many short sighted policies in the past, and it is to be hoped that the broadening influence of the textile school may help to usher in a new era.



Courses of Instruction, Day Classes.

[For details of the several subjects see subsequent page]

First Year.—First Term:

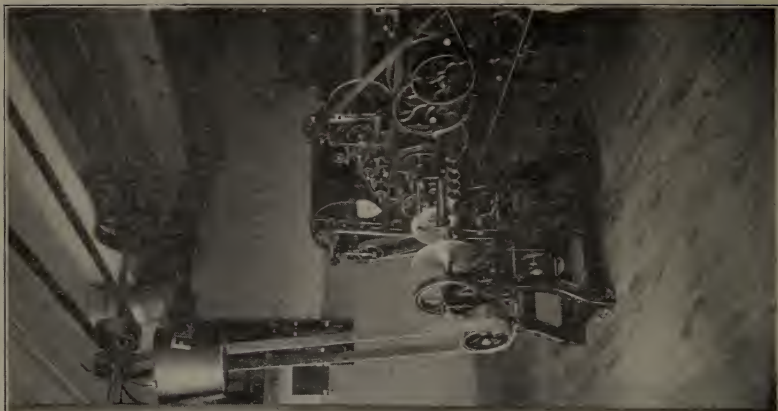
Design Construction.	} common to all courses.
Cloth Construction.	
Cloth Analysis.	
Hand Looms.	
Elements of Mechanism.	
General Chemistry.	
Mechanical Drawing.	
Freehand Drawing.	

Course I.—Cotton Manufacturing.

First Year.—First Term. (Common to all courses ; see above)

First Year.—Second Term.

Cotton Fibre.
Cotton Manipulation.
Design Construction.
Cloth Construction.
Cloth Analysis.
Hand Looms.
Elements of Mechanism.
General Chemistry.
Mechanical Drawing.
Freehand Drawing.



WORSTED COME

Second Year.—First Term.

Cotton Manipulation.
Applied Mechanics.
Machine Drawing.
Warp Preparation.
Weaving.
Textile Chemistry and Dyeing.
Designing.
Cloth Analysis.
Hand Looms.

Second Year.—Second Term.

Cotton Manipulation.
Applied Mechanics.
Machine Drawing.
Weaving.
Textile Chemistry and Dyeing.
Designing.
Cloth Analysis.
Hand Looms.

Third Year.

Cotton Manipulation,
Designing.
Weaving.
Mill Engineering.
Thesis.

Course II.—Wool Manufacturing.

First Year.—First Term. (Common to all courses see page 32)

First Year.—Second Term

Wool Fibre.
Woolen Spinning,
Design Construction

Cloth Construction.
Cloth Analysis.
Hand Looms.
Elements of Mechanism.
General Chemistry.
Mechanical Drawing.
Frechand Drawing.

Second Year.—First Term.

Worsted Spinning.
Applied Mechanics.
Machine Drawing.
Warp Preparation.
Weaving.
Textile Chemistry and Dyeing.
Designing.
Cloth Analysis.
Hand Looms.

Second Term.

Worsted Spinning.
Applied Mechanics.
Machine Drawing.
Weaving.
Textile Chemistry and Dyeing.
Designing.
Cloth Analysis.
Hand Looms.

Third Year.

Wool Manipulation.
Designing.
Weaving.
Mill Engineering.
Thesis.

Course III.—Designing.

First Year.—First Term. (Common to all courses, see page 32)

First Year.—Second Term.

Design Construction.
Cloth Construction.
Cloth Analysis.
Hand Looms.
Design Sketching.
Freehand Drawing.
Mechanical Drawing.
Elements of Mechanism.
General Chemistry.
Options:
 Woolen and Worsted Spinning.
 Cotton Spinning.

Second Year.

Design Construction.
Cloth Construction.
Cloth Analysis.
Hand Looms.
Design Sketching and Jacquard Work.
Art Department.
Weaving.
Textile Chemistry and Dyeing.
Options:
 Woolen and Worsted Spinning.
 Cotton Spinning.
 Applied Mechanics.

Third Year.

Designing.
Weaving.
Thesis.

Options:

Woolen and Worsted Spinning.

Cotton Spinning.

Mill Engineering.

Course IV.—Chemistry and Dyeing.

First Year.—First Term. (Common to all courses, see page 32)

First Year.—Second Term.

General Chemistry.

Qualitative Analysis.

Stoichiometry.

Mechanical Drawing.

Elements of Mechanism.

Designing.

Cloth Analysis.

Hand Looms.

Second Year.

Textile Chemistry and Dyeing.

Advanced Inorganic Chemistry.

Chemical Philosophy.

Organic Chemistry.

Options:

Designing.

Weaving.

Applied Mechanics.

Third Year.

Quantitative Analysis.

Industrial Chemistry.

Textile Chemistry and Dyeing.

Dye Testing.

Thesis.



WORSTED CARD

Cotton Department.

First Year.

1. The Cotton Fibre.

Cotton Selection.

Classification of cotton.

Varieties of cotton from different parts of the world.

The Cotton Gin.

Hand and Mechanical methods of mixing and distributing cotton from the bale.

The construction of the Automatic Feeder.

The construction of the Opener.

The construction of the Breaker.

The construction of the Intermediate and Finisher Lappers.

The operation and care of Picking Machinery.

Theory of Carding and development of Carding Machinery.

The stationary Top Card.

The revolving Top Card.

Card Grinding, Setting, Stripping, and Care of Cards.

2. Practical work on machines named in above lectures timed to correspond with lecture course.

3. Lessons on calculations in connection with the machines named above.

Second Year.

1. Course of lectures on the following subjects :

Construction and use of the Railway Head.

Principle of Drawing processes.

Construction and care of the Drawing Frame.

The development of the Fly Frame.

The construction and use of the Slubbing Frame.

The construction and use of the Intermediate Frame.

The construction and use of the Fine Frame.

The operation and care of the Flyer Frames.

The construction and use of the Ring Spinning Frame.

2. Practical work on machines named in the above lectures
timed to correspond with the lecture course.

3. Lessons on calculations connected with the above machines.

Third Year.

1. Course of lectures on :

Construction and use of the Cotton Comb.

Construction and use of the Sliver Lap Machine.

Construction and use of the Ribbon Lap Machine.

The operation and care of Combing Machinery.

The construction and use of the Spinning Mule.

The construction and use of the Spooler.

The construction and use of the Warper.

The construction and use of the Slasher.

Drawing-in.

2. List of machinery adapted for different purposes in Cotton
Mill Work.

Layout of machinery for different processes.



Woolen and Worsted Department.

WOOLEN SPINNING.

First Year.

Lecture Course:

Animal and Vegetable fibres.

Discussion of the various kinds of Wool and their uses.

Wool sorting.

Manufacture and use of Shoddies, Mungoes, Extracts, Flocks, Noils.

Wool Washing, including the construction and uses of Washing Machines and Hydro-Extractors, and materials used as Detergents.

Carbonization, Wet and Dry Processes.

The Solvent Process for cleansing Wool.

Construction and uses of Dryers (Table and Artificial).

Shrinkage of Wool in Washing.

Construction and uses of the several kinds of Pickers, Burring and Garnetting Machines.

Picking, Mixing, Blending and Oiling.

Kinds and quantities of Oil. Testing.

Principles of Carding.

Carding in the First Breaker, Second Breaker and Finisher.

Condensers—Single and Double Doffers, Bollete, Ring, etc.

Setting and uses of the various parts of the Card.

The various kinds of Feed,—Hand, Bramwell, Apperly, Camel-back, Torrance Balling Head and Creel, etc.

Card Clothing,—various kinds of Backing (Leather, Linen, Flexifort, etc.) Kinds and sizes of Wire; Garnett Wire.

Method of counting. Card Clothing (counts and crowns.)
Setting up Cards, turning up Cylinders, clothing the Card, grinding.
Speeds, production, etc.
Principles of spinning.
History and development.
Hand Jack, self-operating and self-acting Mules.
The Mule-head.
Method of driving the various parts, Rolls, Spindles, Carriage, etc.
Backing off.
Winding Mechanism.
Study of the Quadrant and Builder-rail.
Regulation of the Fallers.
Twisting.

With the above lectures will be given all the necessary calculations and actual practice on the various machines.

WORSTED SPINNING.

Second Year.

Lecture course :
The differences between a Worsted and a Woolen Thread.
Carding.
Preparing.
What wools are Prepared and why they are not Carded.
Doubling and Back Washing.—the nature of these processes.
The principles, history and development of Combing.
Combing on the Noble and Lister Machines.
Pin Setting.
Gilling and Top Making.
The hygroscopic property of Wool.
Conditioning of Tops.
Principles of Drawing.
Construction of the Drawing and Roving Frames.
Drawing on the Open, Cone and French Systems.



HAND LOOM ROOM

Study of the Drag.

Stop Motions.

Construction and uses of Gauge Points.

Principles of Spinning.

Spinning on the Cap, Flyer and Ring Frames.

Worsted Mule Spinning.

Types of Frames (Leicester and Illingworth).

Spinning of Carpet and Botany yarns.

The system of counting Worsted yarns.

Doubling and Twisting, including the construction and uses of
the various kinds of Twistors.

Winding, Hanking, Balling and Bundling.

Yarn Testing, etc.

The above lectures include all the necessary calculations and
actual practice on the various machines.

Third Year.

Manufacture of fancy yarns.

Fancy mixed yarns.

Woolen and cotton.

Woolen and silk.

Woolen and worsted.

Union yarns, (Worsted and Cotton).

Two, three and more, ply fancy twists.

Fancy Knotted yarns, Knickerbocker. etc.

Loop, slub and mottled yarns.

Color as applied to fancy yarns.

Layout of machinery for different processes.

Humidifying and Humidifiers.

Designing Department.

GENERAL COURSE.

First Year.

1. Course of lectures on cloth construction and designing in Cotton, Woolen, Worsted and Silk.

Classifications of fabrics.

Plain fabrics and fabrics on a plain cloth basis.

Names and explanations of different parts of cloth and terms applied to weaves, etc. Point or design paper.

Methods of representing weaves, drafts, etc., on paper.

Explanation of harness and chain drafts.

Twill cloth and combination of same.

Broken twills.

Sateens.

Combination of weaves.

Figured weaving on plain ground.

Diapers, coatings, trouserings.

Colored goods, stripes.

Checked goods.

2. Practical work and lessons on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, etc., on paper, including yarn and cloth calculations, as below.

3. Practical work on hand looms, putting into operation the principles taught in the foregoing course.

Yarn and cloth calculations.

4. The uses of textile calculations, methods of naming or counting cotton, worsted and linen yarns.

Methods of naming woolen yarns.

are required, and before completing the course, in addition to a large amount of preliminary laboratory work, each student must satisfactorily analyze at least 30 solutions and 10 solids containing any of the common metals and acids, and six alloys containing any of the common metals. At the close of the course, each student will be required to pass a written examination upon the subject as well as a practical examination involving the analysis of a solution and a solid, each of which will contain at least ten of the common metals and acids.

STOICHIOMETRY.

This subject will be taken up by the chemistry and dyeing students during the second term of the first year. Special attention will be paid to the writing of the chemical equations, representing the chemical reactions involved in the qualitative analysis. The application of the metric system will be carefully studied; as well as the different thermometric and specific gravity scales; and problems will be worked by the students involving the expansion and contraction of glass, determination of percentage composition of chemical compounds, etc., etc.

TEXTILE CHEMISTRY AND DYEING.

The general treatment of this subject will come during the second year, for all three of the courses in the Chemistry and Dyeing Department.

Outline of subjects taken up:—

Technology of Vegetable Fibres.—Cotton, linen, jute, hemp, China grass, etc. Chemical and physical properties, chemical composition, microscopical study, action of chemicals, acids, alkalies, heat, etc.

Technology of Animal Fibres.—Wool, silk, etc. Chemical and physical properties, chemical composition, microscopical study, action of chemicals, acids, alkalies, heat, etc.

Operations Preliminary to Dyeing.—Bleaching of cotton and linen, wool scouring, bleaching, pulling and felting, silk scouring and bleaching, action of soaps.

Water and its Application in the Textile Industry.—Impurities present, the methods of their detection, their effect during different operations, and methods for their removal or correction.

Mordants and other Chemical Compounds used in textile coloring not classed as dyestuffs.—Theory of mordants, their chemical properties and their application, aluminium mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, sulphated oil, fixing agents, leveling agents, assistants, etc.

Theory of Dyeing.—Chemical, mechanical, solution, etc.

Natural Coloring Matters.—Origin, properties, application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, turmeric, madder, quercitron bark, Persian berries, etc., etc.

Artificial Coloring Matters.—General discussion of their history, nature, source, methods of manufacture, and methods of classification.

Special study of :—

Direct Cotton Colors.

Basic Coloring Matters.

Acid Dyestuffs.

Phthalic Anhydride Colors, including the eosins, rhodamines, phloxines, etc.

Alizarin Colors, including other artificial coloring matters requiring a metallic mordant.

Insoluble Azo Colors, developed on the fibre.

Aniline Black, artificial indigo, and other artificial dyestuffs not coming under the above heads.

MACHINERY USED IN DYEING.

A certain amount of time will be devoted to description of the machinery used in the various processes of textile coloring, and this





will be supplemented as far as is possible by the use of charts diagrams, lantern slides, and visits to the various dye houses in the vicinity.

Besides lectures and recitations upon this subject, those taking the regular day course in Chemistry and Dyeing will be required to do at least fifteen hours per week of practical laboratory work. By the performance of careful and systematic experiments the student will learn the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances, and the conditions under which they give the best results. The more representative dyestuffs of each class will be applied to cotton, wool and silk, and each student will be obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy, most of the dye trials will be made upon small skeins or swatches of the required material, but from time to time the students will be required to dye larger quantities.

By the use of a small printing machine the principles of calico, printing, and by the introduction of small dyeing machines, vats, etc., the practical side of the subject will be studied, and it will be the constant endeavor of those in charge, to impart such information of a theoretical and scientific character as is usually difficult to obtain in a dyehouse.

ADVANCED INORGANIC CHEMISTRY.

The whole subject of inorganic chemistry will be reviewed during the second year, and many advanced topics will be introduced which were necessarily omitted from the first year course in General Chemistry.

CHEMICAL PHILOSOPHY.

This will be a continuation of the Stoichiometry of the first year.

The work will be thoroughly practical, the student will be familiarized with the important laws of specific gravity, calorimetry, specific heat, vapor density, etc., and will be required to work a large number of problems which the subject introduces.

ORGANIC CHEMISTRY.

This subject, which was introduced during the latter part of first year general chemistry, will be continued during the whole of the second year as a special subject. The study will be taken up in a thorough manner and by the end of the year the student will understand the composition of the important artificial dye-stuffs and the equations representing the reactions involved in their manufacture.

INDUSTRIAL CHEMISTRY.

A course of lectures upon this subject will be delivered during the third year, particular attention being paid to those branches which are of special interest to the textile chemist, as oils, soaps, the gas and coal tar industry, building materials, and the manufacture of the important chemical compounds, acids, alkalies, bleaching powder, various mordants, etc., on a large scale.

The lectures will be illustrated as far as possible with experiments, specimens, diagrams, and charts, and the students will be given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

QUANTITATIVE ANALYSIS.

This is a third year subject for the students in the Chemistry and Dyeing course.

In addition to lectures and recitations, each student will be required to do a considerable amount of quantitative analytical work. He will become familiar with the use of the analytical balance, perform numerous simple analyses, both gravimetric and volumetric, and before the completion of the subject take up the analysis of acids, alkalies, soap, coal, water, bleaching powder, lime, etc.

Weaving Department.

POWER LOOM WEAVING DEPARTMENT.

First Year.

1 Course of lectures on Weaving Machinery and Processes, as used for Cotton, Woolen, Worsted and Silk, including Warp Preparation. Subjects:—

Process of making pattern warps.

The construction and use of Spooling Machinery for wool and cotton.

The construction and use of Warpers of various kinds.

The Woolen Sizing Machine..

The Woolen Beamer.

Sizing materials and size mixing machinery.

Long and short chain systems of preparing warps and filling.

Drawing-in and twisting.

2. Practical work on machines named above, and warp preparation in cotton, woolen and worsted, timed to correspond with the respective lectures.

3. Lessons on calculations applied to the machines and processes named above.

Second Year.

1. Course of lectures on weaving mechanism, as follows:—

The plain power loom and its construction.

Shedding by cams.

Various pickers and picking motions.

Fast and loose reeds.

Take up and let off motions.

Minor adjustments of the power loom.

Plain looms as altered for weaving fancy cloth.

Looms constructed for several shuttles.

Drop box motions.

Shedding motions.

Single acting dobbies.

Double acting dobbies.

Spring boxes and other motions for returning harness.

Chain building for dobbies.

Chain building for box looms.

Various handkerchief motions.

Lappet motions.

Towel and other pile cloth weaving.

Open and close shed looms.

Gauze and Leno weaving.

2. Practical work on the above looms, including teaching the student to weave and fix looms.

Also pulling down looms and rebuilding same, including timing and setting.

This work will be arranged to correspond with the respective lectures.

3. Lessons on calculations applied to the machines and processes named above.

Third Year.

1. Lectures on Jacquared machinery.

Single lift Jacquards.

Double lift Jacquards.

Leno Jacquards.

Jacquards specially arranged for such work as ingrain carpet work.

Tapestry weaving, quilt weaving, and so on.

Weave room, engineering and equipment.

Cost of weave mill operation and statistics of operations.

The humidifying, lighting and fire protecting of weave mills.



LABORATORY

Finishing Department :

Knotting and burling.

Fulling, construction of the several kinds of fulling machines.

Gigging, construction of the gig.

Shearing, construction of the shear.

Pressing, construction of the several kinds of presses.

Measuring and weighing, ticketing, numbering and rolling.

Cloth folders.

Cloth brushes.

Baling and casing of cloth for shipment.



Decorative Art Department.

The close relation Decorative Art bears to the textile industry requires the organization of a Decorative Art Department.

While it is the special object of the School to give instruction in this department of such a character as to develop a knowledge of the laws of decoration and theory of design as applied to textile fabrics of every kind, it is a fact that the fundamental instruction necessary for this is similar to that required for other branches of decorative art, so that the attention of students not necessarily intending to follow textile manufacturing is invited.

Special arrangements have been made to form classes in free-hand drawing and decoration, for the purpose of giving the students general instruction in the theory and practice of decorative art, the instruction afterwards to be devoted to the special branch the student desires to follow. The School will thus fulfill the object of preparing the student in practical designing in any of the branches of decorative art, with special regard to fabrics.

Day Course.

DECORATION.

1. Instruction and training of hand and eye in freehand and Geometrical Drawing.
2. Advanced instruction and practice in Freehand and Geometrical Drawing.
3. Instruction in line, form, color and tone, based on historic ornament.
4. The application of natural (conventionalized) forms,—plants, etc.,—according to the laws that have been evidenced by the study of historic ornament, with special reference to textile design.

These studies are preparatory and essential to excellence in sketching for Jacquard fabrics, damasks, ingrain, brussels and other carpets, grenadines, bed spreads, table cloths, etc., and general applied textile design, and equally so to any other branch of Decorative Art.

The fee for the day course will be \$15.00 per term.

Additional Classes.

If there is sufficient demand, there will be additional classes established in other departments of Decorative Art, when this can be done without interfering with the regular school course.

Those desiring such instruction are invited to correspond with the Principal with a view to the formation of any such special classes.

Materials.

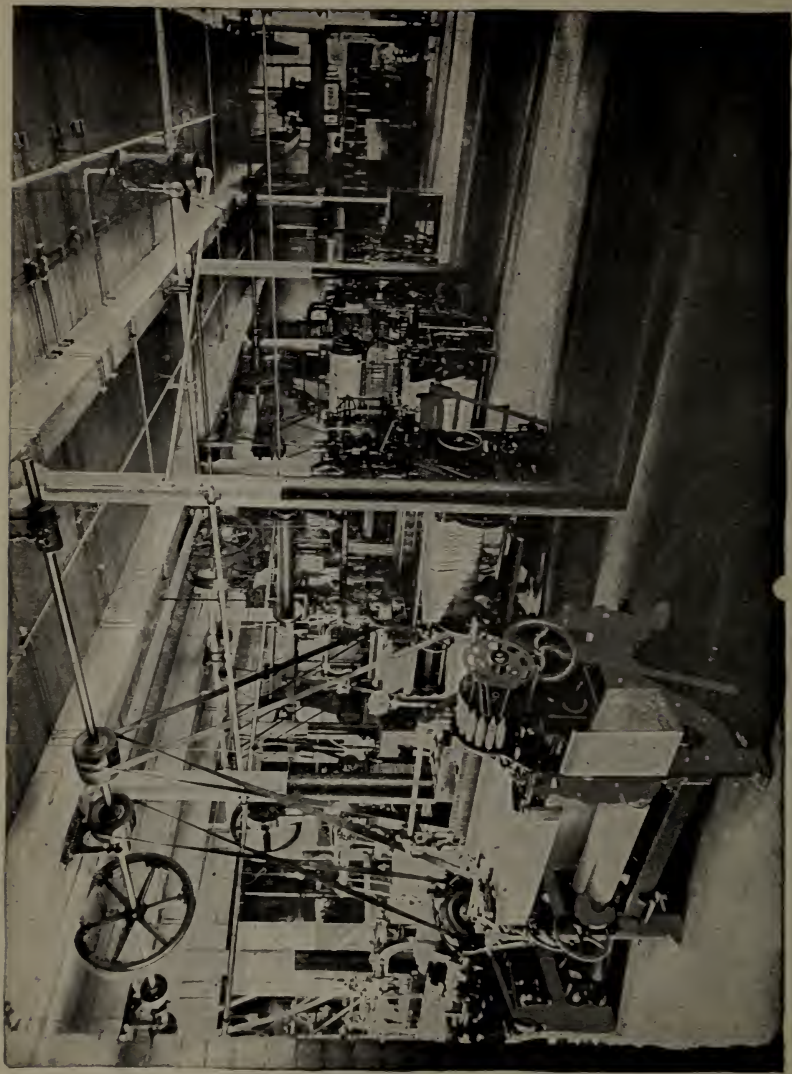
The materials to be purchased will probably cost \$10.00 and upwards, unless the student already possesses drawing instruments, paint boxes, brushes, etc., in which case the amount will be considerably reduced.



Department of Mechanics.

First Year. :

Lecture Course.
Elements of Mechanism.
Definitions.
Force and Work, Measurement of.
Screw.
Worm and Wheel.
Pulley Blocks.
Inclined Plane and Wedge.
Rolling Cylinders and Cones.
Gearing, Spur and Friction.
Flexible Connectors.
 Belts.
 Cords.
 Chains.
Levers.
Cams.
Wipers.
Toggle Joint.
Quick Return Motions.
Harmonic Motion.
Wheels in Trains.
Mangle Wheels,
Aggregate Combinations.
Differential Pulleys.
Epicyclic Trains.
Disc and Roller.
Motive Power for Mills.
Motors; etc.,



POWER WEAVE ROOM

Mechanical Drawing.

Care and use of Instruments.
Geometrical Constructions.
Elements of Projections.
Isometric Drawings.
Working Drawings.
Blue Print Process.

Second Year.

Applied Mechanics.
Strength of Materials.

In the above topics will be included as many problems as possible, dealing with the construction and maintenance of mills, not with the purpose of educating mill engineers, but rather to familiarize the student with the means at hand and processes employed in erecting structures for manufacturing, that they may study their government more advantageously.

Machine Drawing.

Practical sketching from machines, both for mechanism construction, and detail and assembly drawing.

Third Year.

Mill Construction.
“ Ventilation.
“ Humidifying.
“ Warming.
“ Maintenance.
“ Fire Protection.

Several courses of lectures on allied subjects by outside lecturers will be added,



Languages.

A department of modern languages has been established at the School; students of the school are offered either of these courses at a charge of \$5 for 20 lessons.

Others who may desire to avail themselves of these language courses, without taking other courses, may do so at a charge of \$8 for 20 lessons.

In general the classes will meet after four o'clock in the afternoon.

Announcement of the classes, and further information may be had by addressing the Principal.

General Lectures.

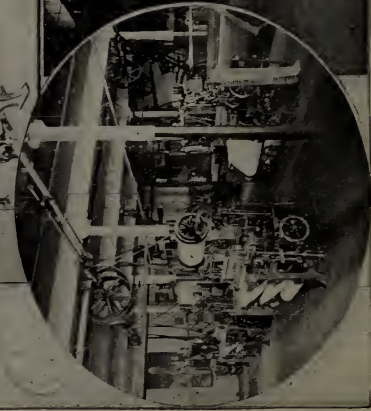
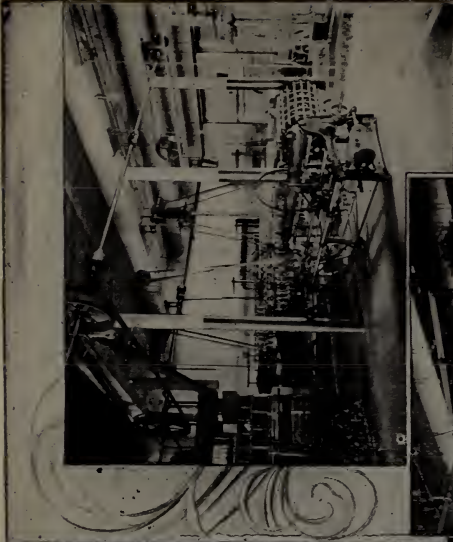
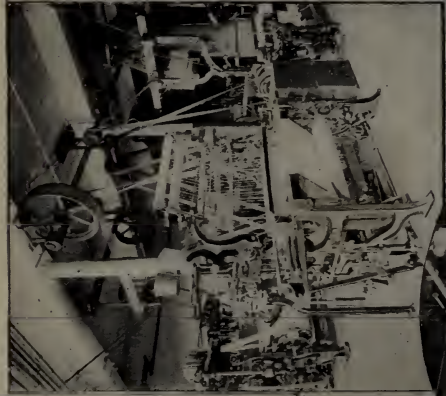
Lectures on the various branches and specialties of the textile business will be given from time to time. Among the subjects will be Patent Law; Fire Protection; Mill Costs; Finishing; Power, Heat, and Light.

Evening Classes.

The courses of instruction offered in the evening are identical with those of the day, with the exception that less time is devoted to the machine work, since, in most cases this is of small moment; ordinarily the handling of the machinery is a part familiar to most of the students through contact with it in the day time, and in such cases the explanations and calculations are of the greater importance. In some cases it is possible to pursue two courses together; but depends always on the arrangement of the schedule for any particular year.

The evening courses are free to graduates of the Evening High and Drawing Schools, operatives of the mills and machine shops, and other residents of Lowell, to such numbers as may be accommodated in the various classes. Applications will be considered in the order in which they are received.

The requirements for admission to the Evening Classes are similar to those for the Day. Graduates of other schools, will be received on presentation of proper credentials; for all others,



VIEWS IN WEAVE ROOM

examinations will be held on Thursday, Sept. 28, at 7 P. M. at the School. The candidates must be familiar with the English language, and the principles of arithmetic; for the first part, a short composition must be written on a given theme, while in the latter will be included addition, decimals, fractions, percentage, ratio and proportion

Subjects.

The list of subjects embraced in each course is identical with that of the day and may be found beginning at page 37.

Certificate.

With the honorable and satisfactory completion of the three year evening course in any subject, the certificate of the School will be awarded.

Course I, Cotton Spinning.

Fee for all except residents of Lowell, \$2.50 per term. \$5.00 per year.

Course II, Woolen and Worsted Spinning.

Fee for all except residents of Lowell, \$2.50 per term. \$5.00 per year.

Course III, Designing.

Fee for all except residents of Lowell, \$5.00 per term. \$10.00 per year.

Course IV, Chemistry and Dyeing.

Fee for all except residents of Lowell, \$5.00 per term. \$10.00 per year. A deposit of \$5 will be required from all who take this course, whether residents of Lowell, or not, to cover the cost of laboratory breakages; at the end of the year any unexpended balance will be returned, or an extra charge made, as the case may be.

Course V, Warp Preparation and Weaving.

Fee for all, except residents of Lowell, \$2.50 per term. \$5.00 per year.

General.

The schedule showing the arrangements of classes for each term will be announced at the opening of each term.

Register of Students 1898-99.

Day Students

	COURSE.	YEAR.	ADDRESS.
Bailey, J. W.	I	3	Waltham, Mass.
Harmon, C. F.	I	3	Lowell, Mass.
Smith, A. A.	I	3	" "
Cuttle, J. H.	II	3	" "
Fels, A. B.	II	3	Dracut, Mass.
Tilton, E. T.	II	3	Lowell, Mass.
Gerrish, W.	III	3	" "
Lamson, G. F.	I	2	" "
Smith, S. E.	I	2	Methuen, Mass.
Stewart, S.	I	2	Lewiston, Maine
Bodwell, H. A.	II	2	Andover, Mass.
Brickett, C. J.	II	2	Haverhill, Mass.
Stewart, A.	II	2	Beauharnois, Ca.
Syme, J. F.	II	2	Worcester, Mass.
Perkins, J. E.	III	2	Pittsfield, Mass.
Pradel, A. J.	III	2	Collinsville, Mass.
Trull, J. C.	III	2	N. Tewksbury, Mass.
Wing, C. T.	III	2	Lowell, Mass.
Pohlman, G. C.	IV	2	Fitchburg, Mass.
Sleeper, R. R.	IV	2	Lowell, Mass.
Thomson, H. J.	IV	2	Lawrence, Mass.
Cranska, L. B.	I	1	Moosup, Conn.
Fowler, Bailey.	I	1	Augusta, Ga.

NAME.	COURSE.	YEAR.	ADDRESS.
Leach, J. P. Jr.	I	I	Littleton. N. C.
Marinel, W. N.	I	I	N. Chelmsford, Mass.
Parker. B. M.	I	I	Raleigh, N. C.
Buchan, D. C.	II	I	Andover, Mass.
Dowling, J. A.	II	I	Malden, Mass.
Foster, C. E.	II	I	Worcester, Mass.
Hitchcock, T. B.	II	I	Boston, Mass.
Murphy, E. M.	II	I	Lowell, Mass.
Wise, P. T.	II	I	Malden, Mass.
Parker, H. C.	III	I	Fitchburg, Mass.
Kingsbury, P. F.	IV	I	Lowell, Mass.
Moorhouse, W. R.	IV	I	Sabattus, Me.
Webber, A. H.	IV	I	Beverly, Mass.

ART COURSE.

Burrage, Miss Katharine	Lowell, Mass.
Calef, Miss S. E.	" "
Campbell, Miss L. E.	" "
Chase, E. D.	" "
Cuttle, P.	" "
Dalton, Miss G. G.	Salem, Mass.
Gardner, A. W.	Lowell, Mass.
Goodhue, Miss A. H.	Dracut, Mass.
Lakeman, Miss Fanny	Salem, Mass.
Merchant, Miss E. C.	Lowell, Mass.
Pettingill, Miss B. C.	Lowell, Mass.
Richardson, Miss A.	N. Andover, Mass.
Woodies, Miss I. A.	Lowell, Mass.

Special,

Barber, W. D.	I	I	Pawtucket, R. I.
Collins, C. W.	I	I	Providence, R. I.
Dabney, W. L.	I	I	Buckingham, Va.
Parks, P. B.	I	I	Concord, N. C.

NAME.	COURSE.	YEAR.	ADDRESS.
Brown, H. W.	II	1	Newport, N. H.
Kerr, L. R.	III	1	Lowell, Mass.
Robinson, C. A.	III	1	Utica, N. Y.
Jorgensen, L.	V	1	Chicago, Ill.
Baldwin, A. L.	IV	1	Lowell, Mass.
Reynolds, R. W.		1	Livermore Falls, Me.
Hinckley, E. H.	I	3	Boston, Mass.
Morton, W. E.	I	2	Clover, S. C.
Mann, A. M.	I	2	Boston, Mass.
Ramsdell, A. R.	I	2	Andover, Mass.
Spain, J. W.	I	2	Quitman, Ga.
Bissell, W. E.	II	2	Lowell, Mass.
Hanley, C. F.	III	2	Worcester, Mass.

Evening Students

Caverly, R. H.	I	1	Chelmsford, Mass.
Cole, H. C.	I	1	Rockingham, N. C.
Coughlin, Jos.	I	1	Lowell, Mass.
Cunningham, C. D.	I	1	Lawrence, Mass.
Foss, Gilbert	I	1	Methuen, Mass.
Hall, F. S.	I	1	Lowell, Mass.
Kennedy, C. A.	I	1	" "
Libby, F. V.	I	1	" "
Martin, G. R.	I	1	Medford, Mass.
Reynolds, K. W.	I	1	Lowell, Mass.
Roper, Wm.	I	1	" "
Scarlott, Geo.	I	1	" "
Selfredge, H.	I	1	" "
Sullivan, J. E.	I	1	Roxbury, Mass.
Wardrobe, W. L.	I	1	Lawrence, Mass.
Wesson, P. B.	I	1	Tyngsboro, Mass.
Woodbury, D. D.	I	1	Methuen, Mass.
Woodbury, Sanford W.	I	1	Lawrence, Mass.
Cullinan, M. H.	I	2	Lowell, Mass.

Harris, W. O.	I	2	Westford, Mass.
Green, A. H.	I	2	Lowell, Mass.
Mitchell, A. L.	I	1	Lowell, Mass.
Osgood, C. F.	I	2	Lowell, Mass.
Parks, P. B.	I & V	2	Lowell, Mass.
Pickering, H. E.	I	2	N. Tewksbury, Mass.
Shaw, F. P.	I	2	Lowell, Mass.
Willey, F. S.	I	2	" "
Benner, E. W.	I	3	" "
Broadbent, J. T.	I	3	" "
Donnelly, Jas.	I	3	" "
Reed, Geo. E.	I	3	" "
Reynolds, P. L.	I	3	Fall River, Mass.
Rooney, G. W.	I	3	Lowell, Mass.
Silcox, S. E.	I	3	" "
Speakman, T. H.	I	3	" "
Swift, E. S.	V	3	" "
Wright, W. G.	I	3	" "
Young, W. L.	I	3	" "
Wise, P. T.	II	1	" "
Abbott, A. L.	II	1	" "
Campbell, A. D.	II	2	Lawrence, Mass.
Colby, A. D.	II	2	Lowell, Mass.
Constantineau, P. J.	II	2	N. Chelmsford, Mass.
Crysler, H. Stanley	II	2	Lowell, Mass.
Dixon, Hampden	II	2	N. Chelmsford, Mass.
Dunnigan, Wm.	II	2	N. Chelmsford, Mass.
Flather, F. A.	II	2	Lowell, Mass.
Grady, E. F.	II	2	Lowell, Mass.
Hand, E. F.	II	2	Lowell, Mass.
Hey, J. W.	II	2	Lawrence, Mass.
Hitchcock, T. B.	II	1	Lowell, Mass.
Leiper, J.	II	2	" "
Maden, Harry	II	2	" "

McKittrick, K. J.	II	2	Lowell, Mass.
Meyers, John	II	2	" "
Moore, C. A.	II	2	N. Chelmsford, Mass.
Nelson, Ernest	II	2	Lowell, Mass.
Ogley, Samuel	II	2	N. Billerica, Mass.
Ramsbottom, Harry	II	2	Lawrence, Mass.
Robinson, C. A.	II & V	1	Lowell, Mass.
Rowell, H. C.	II	2	" "
Soderberg, S. E.	II	2	Chelmsford, Mass.
Southwell, Jas.	II	2	Lawrence, Mass.
Syme, J. F.	II	2	Lowell, Mass.
Whitaker, C. Jr.	II	2	Tyngsboro, Mass.
Binns, Heaton	II & V	2 & 3	Lowell, Mass.
Crompton, H. H.	II	3	Methuen, Mass.
Kellett, Irvine	II	3	Lawrence, Mass.
Marjerison, I. D.	II	3	Lawrence, Mass.
Nugent, T. A.	II & V	3	Lowell, Mass.
Stopherd, W. H.	II & V	3	" "
Stevenson, Wm.	II	3	N. Billerica, Mass.
Bowen, E. E.	III	1	Lowell, Mass.
Bowen, F. A.	III	1	" "
Boyd, P. S.	III	1	" "
Brady, C. T.	III	1	Methuen, Mass.
Brooks, Noah	III	1	Lowell, Mass.
Brown, J. P.	III	1	Lowell, Mass.
Buzzell, Wm.	III	1	Methuen, Mass.
Cheetham, J. J.	III	1	Lowell, Mass.
Childs, C. N.	III	1	" "
Dabney, W. L.	III	1	" "
Davis, J. W.	III	1	" "
Fish, Geo.	III	1	" "
Fraser, Jas.	III	1	" "
Hamblett, H. A.	III	1	Dracut, Mass.
Hunter, Ralph	III	1	Medford, Mass.

Knowles, F. E.	III	1	Lowell, Mass.
Leach, J. P. Jr.	III	1	Lowell, Mass.
Loranger, A. M.	III	1	Lowell, Mass.
Lord, Wilfred	III	1	Lawrence, Mass.
McDavitt, W. L.	III	1	Lawrence, Mass.
McLaren, A. A.	III	1	Lowell, Mass.
Nelson, Thos.	III	1	" "
Reynolds, H. L.	III	1	" "
Rodger, W. M.	III	1	" "
Saunders, E. B.	III & V	1 & 2	" "
Spain, J. W.	III	1	" "
Stott, C. W.	III	1	" "
Underhill, E. J.	III	1	" "
Williams, A. E.	III	1	" "
Wilkinson, J. R.	III	1	" "
Barr, I. W.	III	2	" "
Elston, F. R.	III	2	Lawrence, Mass.
McArthur, R. B.	III	2	Lowell, Mass.
Mitchell, T. E.	III & V	2	Mobile, Ala.
Taylor, H. L.	III	2	Lawrence, Mass.
Wilde, C. T.	III	2	N. Andover, Mass.
Berry, F. M.	III	3	Lowell, Mass.
Collier, John	III	3	Dracut, Mass.
Gaunt, A. C.	III	3	Methuen, Mass.
Moir, A. L.	III	3	Lowell, Mass.
Spedding, E. H.	III	3	" "
Wilmot, Wm.	III	3	" "
Wilton, G. H.	III	3	N. Andover, Mass.
Bramhall, F. E.	IV	1	Lowell, Mass.
Crompton, Geo.	IV	1	" "
Fox, G. S.	IV	1	" "
Hope, H. D.	IV	1	" "
Johnson, F. G.	IV	1	Methuen, Mass.
Johnson, Mitchell	IV	1	" "

Magner, F. J.	IV	1	Lowell, Mass.
Meyers, James	IV	1	" "
Murray, G. E.	IV	1	Lawrence, Mass.
Puffer, Geo. F.	IV	1	Lowell, Mass.
Thompson, E. P.	IV	1	Newburyport, Mass.
Tillson, H. E.	IV	1	Lowell, Mass.
Williamson, I. F.	IV	1	" "
Barstow, F. L.	IV	2	Methuen, Mass.
Booth, J. W.	IV	2	Lowell, Mass.
Geary, J. W.	IV	2	" "
Knapton, Sam	IV	2	" "
Livingston, H. R.	IV	2	" "
Snow, F. L.]	IV	2	" "
Waterhouse, Jos.	IV	2	" "
Bodwell, H. A.	V	3	" "
Brickett, C. J.	V	3	" "
Cuttle, J. H.	V	3	" "
Howard, Fred	V	3	" "
Lamson, G. F.	V	3	" "
McAllister, J. W.	V & III	3 & 2	" "
Noble, J. T.	V	2	" "
Pradel, A. J.	V	3	Collinsville, Mass.
Stewart, Arthur	V	3	Lowell, Mass.
Barber, W. D.	V	2	" "
Bevington, J. H.	V	2	Lawrence, Mass.
Brown, F. P.	V	2	Lowell, Mass.
Foster, C. E.	V	2	" "
Gagan, J. H.	V & III	2 & 1	" "
Hutton, Clarence	V	2	" "
Hutton, Richard	V	2	" "
Howard, John	V	2	" "
Kershaw, Wm.	V	2	" "
Morgan, Wm.	V	2	" "

Ormrod, Oliver	V	2	N. Billerica, Mass.
Parker, H. C.	V	2	Lowell, Mass.
Rhodes, Sam.	V	2	" "
Whitworth, Ernest	V	2	" "
Brown, P. B.	V	1	" "
Foss, S. C.	V	1	Methuen, Mass,

SUMMARY.

Day Students.....	66
Evening Students.....	160
	<hr/>
	226
Deduct names counted twice.....	19
	<hr/>
Total registration.....	207

Diplomas were awarded on June 2, 1899, as follows:—

COURSE I.	COURSE II.
J. W. Bailey,	James H. Cuttle.
C. F. Harmon.	A. B. Fels.
A. A. Smith.	E. T. Tilton.

TITLES OF THESES.

Investigation of Evenness of Product in Picking, Carding, and Drawing.

J. W. Bailey, C. F. Harmon and A. A. Smith. Course I.

Comparison of Theory and Practice in the Production of 2-36's Worsted Yarn from the Top.

A. B. Fels and E. T. Tilton. Course II.

Discussion of Methods of Cloth Analysis.

James H. Cuttle. Course II.

Certificates were awarded on June 2, 1899, as follows:—

DAY COURSE.

ART & DESIGN.

Miss Katherine Burrage.

EVENING STUDENTS.

COTTON SPINNING.

James T. Broadbent.

DESIGNING.

Frank M. Berry.

Ephraim H. Spedding.

George H. Wilton.

Alfred C. Gaunt.

William Wilmot.

John Collier.

A. L. Moir.

WOOLEN AND WORSTED SPINNING.

Heaton Binns.

Henry H. Crompton.

Irvine Kellett.

Isaiah D. Margerison.

Thomas A. Nugent

Wm. H. Stopherd.

William Stevenson.

WEAVING.

Heaton Binns.

William H. Stopherd.

Thomas A. Nugent.

John T. Noble.

Edward S. Swift.

J. W. McAllister.



Contributions or loans of machinery, apparatus or material, kindnesses extended or assistance rendered by the following firms or persons are acknowledged with thanks:—

- Actien Gesellschaft fur Anilin Fabrikaten, Berlin.
- Altemus, W. W., Philadelphia, Pa.
- American Card Clothing Co., Lowell, Mass.
- American Drosophore Co., Boston, Mass.
- Appleton Co., Lowell, Mass.
- Arabol Mfg. Co., New York City.
- Arlington Mills, Lawrence, Mass.
- Atlas Mfg. Co., Newark, N. J.
- Atwood Machine Co., Stonington, Conn.
- Avery Chemical Co., Littleton, Mass.
- Badische Anilin und Soda Fabrik. Germany.
- Barbour Bros., Boston, Mass.
- Bartlett & Dow, Lowell, Mass.
- Beach & Co., Hartford, Conn.
- Bennett, Frank P., Boston, Mass.
- Berry, A. Hun, Boston, Mass.
- Boott Mills, Lowell, Mass.
- British Alizarin Co., England.
- Capron, C. C., Uxbridge, Mass.
- Carruthers, Robert, Lowell, Mass.
- Carey, W. W., Lowell, Mass.
- Clark, Jeremiah, Lowell, Mass.
- Coats, J. & P., Pawtucket, R. I.
- Coburn, C. B. & Co., Lowell, Mass.
- Coburn Shuttle Co., Lowell, Mass.
- Crompton-Knowles Loom Works, Worcester, Mass., and Providence, R. I.
- Davis & Furber Machine Co., North Andover Depot, Mass.
- Draper Co., Hopedale, Mass.
- Entwistle, T. C., Lowell, Mass.
- Emmons Loom Harness Co., Lawrence, Mass.

Factory Insurance Association, Hartford, Conn.
Farbenfabriken of Elberfeld Co., New York, N. Y.
Firth, Wm, Boston, Mass.
Furbush Machine Co., Philadelphia, Pa.
Gates, J. & Sons, Lowell, Mass.
General Fire Extinguisher Co., Providence, R. I.
Gherli, A., New York, N. Y.
Gilbert Manufacturing Co., Gilbertville, Mass.
Gilbert Loom Co., Worcester, Mass.
Hamilton Mills, Lowell, Mass.
Hamilton Print Works, Lowell, Mass.
Harwood, G. S. & Son, Boston, Mass.
Holyoke Machine Co., Worcester, Mass.
Howard Bros., Worcester, Mass.
Haworth & Watson, Lowell, Mass.
Jacques Shuttle Co., Lowell, Mass.
Kalle & Co., New York, N. Y.
Kalle & Co., Boston, Mass.
Kittredge, H. G., Boston, Mass.
Kitson, Machine Co., Lowell, Mass.
Knowles Loom Works, Worcester, Mass.
Laminar Fibre Co., Cambridge, Mass.
Lawrence, Manufacturing Co., Lowell, Mass.
Leominster Woolen Co., Leominster, Mass.
Leopold, Cassella, Germany.
Leyland Belting Co., Lawrence, Mass.
Lowell Manufacturing Co., Lowell, Mass.
Lowell Machine Shop, Lowell, Mass.
Lyon, A. S., Lowell, Mass.
Main Belting Co., Boston, Mass.
Massachusetts Co., Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Merrimack Co., Lowell, Mass.
Mather & Platt, England.

Mathieson, W. J. & Co., Boston, Mass.
Mauger & Avery, Boston, Mass
Meister Lucius & Brunning, Germany.
Montgomery, J. R. Co., Windsor, Conn.
Nat. Assn. of Wool Mfrs., Boston, Mass.
N. E. Cotton Mfrs. Assn., Boston, Mass.
New York & Boston Dyewood Co., Boston, Mass.
Olney Bros., Providence, R. I.
Parker, W. H. & Sons. Lowell, Mass.
Pickhardt & Kuttroff, Boston, Mass.
Prince, Smith & Son, Keighley, Eng.
Read, Holliday & Co., Boston, Mass.
Roy, B. S., Worcester Mass.
Royle, John & Son, Paterson, N. J.
Roessler & Hasslacher Chemical Co., New York.
Sargent Sons, C. G., Graniteville, Mass.
Schoelkopp Aniline & Chemical Co., Buffalo, N. Y.
Star Worsted Co., Fitchburg, Mass.
Stevens, M. T. & Sons, No. Andover, Mass.
Stirling Mills, Lowell, Mass.
Stoddard, Haserick & Richards, Boston, Mass.
Sturtevant, B. F. Co., Jamaica Plain, Mass.
Sullivan Machinery Co., Claremont, N. H.
Talbot Mills, North Billerica, Mass.
Talbot Dyewood & Chemical Co., Lowell, Mass.
Tillinghast, Stiles & Co., Providence, R. I.
Torrance Mfg. Co., Harrison, N. J.
Thompson Hardware Co., Lowell, Mass.
Tremont & Suffolk Mills, Lowell, Mass.
Union Shuttle Co., Lawrence, Mass.
United States Aerophor, Air Moistening Co., Providence, R. I.
United States Bunting Co., Lowell, Mass.
Victor, Koechl & Co., Boston, Mass.
Walsh, Thomas, Lowell, Mass.

Wattles, L. R., Canton Junction, Mass.
Whiting, Henry F. Lowell, Mass.
Whitin Machine Works, Whitinsville, Mass.
Whiteley, John & Son, Halifax, Eng.
Williams Roving Carrier Co., Naugatauck, Mass.



Lowell Textile School.

LOWELL, MASS.

APPLICATION BLANK.

Date

I hereby
apply for admission to the Lowell Textile School.

Name in full

Date and place of birth

Home residence

Parent or guardian

Residence

School last attended

Course to be pursued at Lowell Textile School
(not absolutely necessary to choose till the end of first term.)

Cotton Manufacturing.

Wool Manufacturing.

Designing.

Chemistry and Dyeing.

Fill out the above and send to

WM. W. CROSBY, Principal.

THE
Lowell Textile School,
LOWELL, MASS.



CATALOGUE
1900-1901.

LOWELL TEXTILE SCHOOL

LOWELL, MASS.

Annual Catalogue

1900-1901.

Parker Block, Middle and Merrimack Streets

*PRINCIPAL ENTRANCE,
No. 128 Merrimack Street.*

M. G. WIGHT & COMPANY,
LOWELL, MASS.

Trustees of the Lowell Textile School.

[INCORPORATED 1895]

OFFICERS 1900-1901.

A. G. CUMNOCK, PRESIDENT.

A. S. COVEL, VICE-PRESIDENT.

A. G. POLLARD, TREASURER.

JAMES T. SMITH, CLERK.

HONORARY TRUSTEE.

ROGER WOLCOTT.

TRUSTEES.

On the part of the Commonwealth of Massachusetts.

A. S. COVEL, Boston.

FRANKLIN W. HOBBS, Brookline

TRUSTEES EX-OFFICIO.

HON. JEREMIAH CROWLEY,

A. K. WHITCOMB,

Mayor of Lowell.

Supt. of Schools, Lowell.

GEO. H. TAYLOR,

JAMES F. WALKER,

Chairman Lowell Board of Aldermen.

President Lowell Common Council.

By appointment of the Lowell Textile Council.

THOMAS F. CONNOLLY.

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EDWARD W. THOMAS, Agent Tremont & Suffolk Mills, Lowell.

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EUGENE S. HYLAN, Treasurer New England Bunting Co., Lowell.

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FREDERIC S. CLARK, Treasurer Talbot Mills, North Billerica.

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J. W. C. PICKERING, Treasurer Pickering Knitting Co., Lowell.

EDWD. D. HOLDEN, Agent Stirling Mills, Lowell.

WM. M. WOOD, Treasurer American Woolen Co., Andover.

FRANKLIN NOURSE, Agent Lawrence Mfg. Co., Lowell.

GEORGE E. KUNHARDT, Woolen Manufacturer, Lawrence.



GENERAL LECTURE HALL.

Calendar.

1900.

Entrance examinations for day students, Thursday, Sept. 27, at 10 A. M.

Entrance examinations for evening students, Thursday, Sept. 27, at 7 P. M.

School year begins (day) Tuesday, October 2.

Evening school year begins Monday, October 22.

Thanksgiving recess, Thursday, Nov. 29, to Saturday, Dec. 1, inclusive.

Christmas recess, Saturday, Dec. 22, to Tuesday, Jan. 2, 1901 inclusive.

1901.

Semi-annual examinations begin Wednesday, January 23.

Second term begins Tuesday, February 5.

Annual examinations begin Wednesday, May 22.

Diplomas awarded Thursday, June 6.

First entrance examinations Thursday, June 6, at 10 A. M.

There will be no sessions of the school on Washington's Birthday or Patriot's Day.





COTTON SPINNING CLASS ROOM.

Officers of Instruction.

Principal of the School and Professor of Mechanical Engineering,
WM. W. CROSBY, S. B.

Professor of Textile Design and Fabric Structure,
FENWICK UMPLEBY.

Professor of Chemistry and Dyeing,
LOUIS A. OLNEY, A. C.

Head Instructor in Warp Preparation and Weaving,
WILLIAM NELSON.

Professor of Decorative Art,
VESPER L. GEORGE.

Professor of Mathematics and Head Instructor in Woolen
and Worsted Spinning,
EDGAR H. BARKER.

Head Instructor in Cotton Spinning,
OTIS L. HUMPHREY.

Instructor in Chemistry,
G. CARL SPENCER, S. B.

Instructor in Mechanical Drawing,
GEORGE H. PERKINS, S. B.

Instructor in Quantitative Analysis,
BURT R. RICKARDS.

Instructor in Weaving,
THOMAS NELSON.

Instructor in Cotton Spinning,

Assistant Instructor in Woolen and Worsted Spinning,
ARTHUR STEWART.

Assistant Instructor in Designing Department,
A. J. PRADEL.

Assistant in Free Hand Drawing Department,
IDA A. WOODIES.

Assistant in Chemistry,
A. L. BALDWIN.

Faculty.

WILLIAM W. CROSBY.

FENWICK UMPLEBY.

L. A. OLNEY.

VESPER L. GEORGE.

E. H. BARKER.

WM. NELSON.

OTIS L. HUMPHREY.

Lecturer on Mill Engineering,
JAMES G. HILL.

Modern Languages in charge of
PAUL E. KUNZER, PH. D.



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The Lowell Textile School.

The establishing of a school at Lowell for thorough instruction in the theory and practical art of manufacturing all fibers known to the textile industry, although proposed early in 1891, was not determined upon until the organization, methods and scope of such foreign schools, especially in England, France, Switzerland, Germany and Russia, had been carefully studied, and their permanence and value to the textile interests of those countries made clearly apparent.

The " Trustees of the Lowell Textile School " are incorporated under a special act of the Massachusetts Legislature, " for the purpose of establishing and maintaining a Textile school for instruction in the theory and practical art of textile and kindred branches of industry."

The incorporators are representatives either as president, treasurer, agent or superintendent, of the management of the great textile corporations of Lowell, Lawrence and vicinity in the Merrimack Valley with an aggregate capital of over \$65,000,000. By the terms of the By-Laws, at least three-fourths of the Trustees must be " persons actually engaged in or connected with textile or kindred manufactures." This insures the practical character of the management and instruction.

The School is located at Lowell, Massachusetts, the " Mother Textile City of America " the city and state affording financial aid and the manufacturers of New England being equally liberal in contributions. The advantages of the location at a textile centre

where every commercial fibre enters into the products, the student thus being directly in touch with the textile industry and the management thereof, will be apparent.

The School was formally opened by His Excellency Gov. Wolcott on January 30, 1897, in the presence of a large gathering of gentlemen interested in textile industries from all parts of New England. Instruction was commenced on February 1, 1897, and the classes have been regularly conducted since that time, with ever increasing attendance.



The Work of the School.

The principles of science and art are taught, not with the object of educating professional scientific men, but with a view to industrial and commercial applications; but the School offers to graduates of universities and scientific institutions the advantage of technical instruction in the practical application of certain sciences. It also offers special facilities to those entering commercial life for obtaining such knowledge of the construction of textile fabrics and of the languages of foreign commerce as is essential in the marketing of goods abroad.

The equipment of the School consists of high grade machinery with all latest improvements, specially built to afford facilities for all kinds of experimental work, and of such variety as is never found in any one textile mill. With all the machinery that is already installed, the school has a more extensive equipment than any other existing textile school either in America or Europe.

The staff of lecturers and instructors includes gentlemen from the leading scientific and art institutes of Europe and America, and also those who have had special experience in textile school work and in the various processes of textile manufacture, it having been from the first the purpose of the management to furnish as thorough scientific instructors in textiles and textile machine manufacture as is furnished by any Technological Institution in the branches of industry to which it relates.

Day Classes.

These are especially intended for the instruction of those whose intention it is to enter the business of textile manufacturing in any branch. The courses are sufficiently complete to enable one to start without any previous acquaintance with textiles; but at the same time those who have been engaged in such business and wish to improve their knowledge and opportunities, can devote their entire time to study most profitably.



COTTON GINS, PICKERS AND CARDS.

The complete collection of machinery enables every process to be practically illustrated.

The student has the option of selecting any one of five regular or several special courses.

Each course is intended to cover three years. It is optional whether or not a student continues the full course of three years, but this is strongly recommended.

There will be *one term* of preliminary instruction, which will be common to all courses. At the end of this term, each student will be required to select which of the courses he will follow in his subsequent studies, and the instruction to be given after the first term of the first year will be specialized to suit each course.

The five regular diploma courses are :

- I. Cotton Manufacturing.
- II. Wool Manufacturing.
- III. Designing. General Course.
- IV. Chemistry and Dyeing.
- V. Weaving.

Evening Classes.

The second branch of the School work is intended to give thorough evening instruction to those who are engaged during the day in mills and work shops, to enable those who wish it, to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they are regularly engaged, and in the course of several winters to complete a thorough technical education without interfering with their daily duties.

Evening students have the option of entering for one or more of six different courses, and arrangements will be made as far as possible for them to take such a section of each course as is suitable to the student's daily occupation in the mill.

- I. Cotton Spinning.
- II (a.) Woolen Spinning. (b.) Worsted Spinning.
- III. Designing.



COTTON COMB, RAILWAY HEAD AND DRAWING FRAME.

IV. Chemistry and Dyeing.

V. Weaving.

VI. Mechanical Engineering.

Courses I, III, IV and V require three years each ; courses II (b) and VI two years, and course II (a) one year.

For the satisfactory completion of either of these courses, the certificate of the school will be awarded ; the diploma of the school will be awarded in exchange for certificates of satisfactory completion of those subjects which go to make up the several regular diploma courses.

In general it is possible to take up the study of two of the above evening courses concurrently.

The time devoted to practical work both day and evening is considerably longer than that devoted to lectures, and in order to make the instruction real and thorough, no student is allowed to pass to another machine or process until he becomes thoroughly acquainted with the one on which he is engaged.

Women's Department.

Among the many fields in which woman has entered, none has been found in which her natural refinements of taste and skill can be used to better advantage than in designing ; but natural ability though the prime requisite, is by no means all, for a certain amount of technical knowledge must be gained to achieve success. This department combines decorative art and textile design, and in general requires attendance on four afternoons per week.

Commercial Department.

A special course in textile construction and foreign languages is arranged for those contemplating a commercial career.

All such are invited to communicate with the Principal.

Buildings and Equipment.

The building in which the school is situated is of modern slow burning mill construction, equipped with freight and passenger elevators, steam heat, gas and electricity, the latter for both power and light. Each room is protected against fire by sprinklers and thermostats, and self closing fire doors are provided. The humidifiers, motors, shafting, belting, etc., are installed in a most modern manner throughout.

The equipment of machinery is arranged so as to be the most complete of its kind in the world for textile educational purposes; the machinery and plant already in place is of a value of \$80,000, and is such as to enable raw cotton, wool or silk to be treated in the school at every process until it becomes a woven fabric.

New Building.

Plans are now ready for a permanent home for the school, embracing the most modern ideas and latest forms of equipment; it is expected that the new buildings will be ready for occupancy by September 1901.

The equipment of the Cotton Spinning Department includes:—

One Automatic Feeder made by the Kitson Machine Co., Lowell, Mass.

One Single Beater Breaker, made by the Kitson Machine Co., Lowell, Mass.

One Single Beater Finisher made by the Kitson Machine Co., Lowell, Mass.

One Top Flat Card, made by the Lowell Machine Shop, Lowell, Mass.

One Revolving Flat Card, made by the Lowell Machine Shop, Lowell, Mass.

Card Grinding Rolls, Stripping Rolls, etc.

One Sliver Lap Machine, made by the Mason Machine Works, Taunton, Mass.

One Comb made by the Mason Machine Works, Taunton, Mass.

One Railway Head, made by the Lowell Machine Shop, Lowell, Mass.

One Drawing Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Slubber, made by the Lowell Machine Shop, Lowell, Mass.

One Intermediate, made by Lowell Machine Shop, Lowell, Mass.

One Fine Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Ring Spinning Frame, made by the Lowell Machine Shop, Lowell, Mass.

One Spinning Mule, made by the Lowell Machine Shop, Lowell, Mass.

One Spooler, made by the Lowell Machine Shop, Lowell, Mass.

Wet and Dry Twister, made by the Draper Co., Hopedale, Mass.

One Reel, made by the Whitin Machine Works, Whitinsville, Mass.

One 50 Saw Gin.

One Prior Roller Gin.

The Woolen Spinning Department includes :—

One Parkhurst Burr Picker, made by the Atlas Mfg. Co., Newark, N. J.

One Mixing Picker, made by the Davis & Furber Machine Co., North Andover, Mass.

One set of three Woolen Cards, including :—

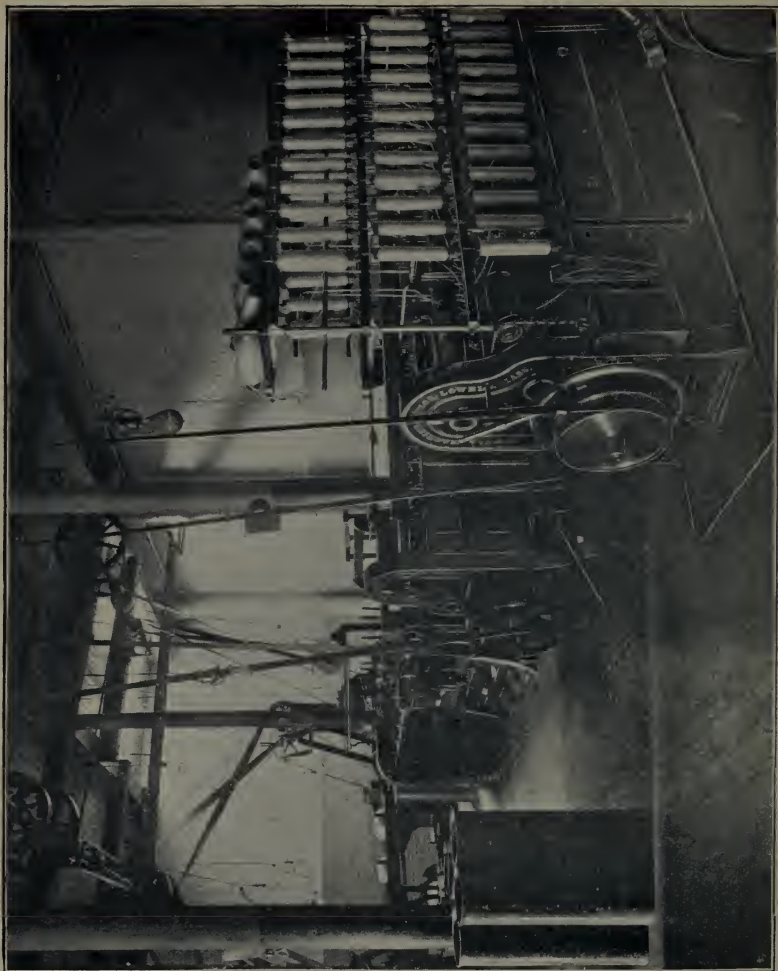
First Breaker, with Bramwell Feeder, made by the Davis & Furber Machine Co., North Andover Mass.

Second Breaker, made by the Davis & Furber Machine Co., North Andover, Mass.

Finisher, made by the Davis & Furber Machine Co., North Andover, Mass.

One Improved Breaker Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Bramwell First Breaker Feed, made by G. S. Harwood & Sons, Boston, Mass.



COTTON COMB AND FLY FRAMES.

One Torrance Balling Head and Creel, made by the Torrance Mfg. Co., Harrison, N. J.

Apperly Feed, made by G. S. Harwood & Sons, Boston, Mass.

One Spinning Mule, 120 spindles, made by the Davis & Furber Machine Co., North Andover, Mass.

One Twister, made by the Davis & Furber Machine Co., North Andover, Mass.

One Roy Grinding Frame, made by B. S. Roy, Worcester, Mass.

One Roy Traverse Grinder, made by B. S. Roy, Worcester, Mass.

The Worsted Spinning Department includes :—

One 50-inch Double Worsted Card (4 lickerin), made by the Davis & Furber Machine Co., North Andover, Mass., and the following made by Prince, Smith & Son, Keighley, England :—

One Revolving Creel for 12 Balls.

One Double Head Can Gill Box.

One 2 Spindle Gill Box.

One 2 Spindle Drawing Box.

One 2 Spindle Weigh Box.

One 4 Spindle Finisher.

One 12 Spindle Dandy Rover.

One 12 Spindle Cap Spinner.

One 12 Spindle Flyer Spinner.

One 12 Spindle Ring Spinner.

One 12 Spindle 2 Fold Cap Twister.

One 12 Spindle 6 Fold Ring Twister.

From Hall & Stell, Keighley, England :—

One Gill Box before combing.

One Gill Box after combing.

One Noble Worsted Comb, from Crompton & Knowles, Worcester.

One Balling Box, from same firm.

The Cotton Warp Preparation Department consists of :—

One Spooler, made by the Lowell Machine Shop, Lowell, Mass.

One Warper, made by the Lowell Machine Shop, Lowell, Mass.

One Slasher, made by the Lowell Machine Shop, Lowell, Mass.

One Beamer, made by T. C. Entwistle, Lowell, Mass.

Drawing-in Frames, etc.

The Woolen and Worsted Warp Preparation Department consists of:—

One Warp Spooler, made by the Davis & Furber Machine Co., North Andover, Mass.

One Dresser, made by the Davis & Furber Machine Co., North Andover, Mass.

One Reel, made by the Davis & Furber Machine Co., North Andover, Mass.

One Beamer, made by the Davis & Furber Machine Co., North Andover, Mass.

One 48 Spool Creel, made by the Davis & Furber Machine Co., North Andover, Mass.

Also a number of hand warping and beaming frames.

The Weaving Department which is the most complete in the world, with regard to the variety of looms, consists of:—

One Plain Northrop Loom, made by the Draper Co., Hopedale, Mass.

One Plain Print Cloth Loom, made by the Whitin Machine Works, Whitinsville, Mass.

One Side Cam Twill Loom, made by the Whitin Machine Works, Whitinsville, Mass.

One Five Harness Heavy Loom, made by the Lowell Machine Shop, Lowell, Mass.

One Plain Print Cloth Loom made by the Mason Machine Works, Taunton, Mass.

And the following looms, made by the Crompton-Knowles Loom Works, Worcester, Mass., and Providence, R. I.

One Knowles Gingham Loom, 4 boxes.

One Knowles Fancy Cotton Loom, with 20 harness dobby, 4 boxes.

One Knowles Fancy Cotton Loom, with 25 harness dobby.

One Knowles Blanket Loom, with 25 harness dobby, 4 boxes.

One Knowles Gem Loom, 20 harness, 4 x 4 boxes.
One Knowles Worsted Loom, 32 harness.
One Knowles Fancy Loom, with single lift jacquard.
One Knowles Fancy Loom, with double lift jacquard.
One Knowles Fancy Loom, with jacquard tied up for leno.
One Knowles Ingrain Carpet Loom, 4 x 4 boxes.
One Crompton Gingham Loom, 4 boxes.
One Crompton Fancy Loom, 6 x 1, with double cylinder 20 harness
dobby.

One Crompton Fancy Cotton Loom with single cylinder 20 harness
dobby.

One Crompton Jean Loom.

One Crompton Lappet Loom, with 16 harness dobbie.

One Crompton Towel Loom.

One Crompton Ingrain Carpet Loom, 4 x 4 boxes.

One Crompton Worsted Loom, 27 harness.

One Crompton Worsted Loom, 24 harness 4 x 4 boxes.

One Crompton & Knowles Heavy Loom, 20 harness, 4 x 4 boxes.

One Lewiston Machine Co. Loom, 4 harness, side cam.

One Lewiston Machine Co. Bag Loom.

There are also the following hand Looms, viz :—

Twelve Hand Looms, 2 x 3 boxes, with 20 harness dobbie.

Eight Hand Looms, 4 x 4 boxes, with 24 harness dobbie.

Six Hand Looms, 3 x 3 boxes, with 32 harness dobbie.

Six Hand Looms, 4 x 4 boxes, with 30 harness dobbie.

Two Hand Looms, with treadles.

Two Hand Looms, 4 x 4 boxes, with 200 hook jacquard.

Two Hand Looms, 3 x 3 boxes, 200 hook jacquard.

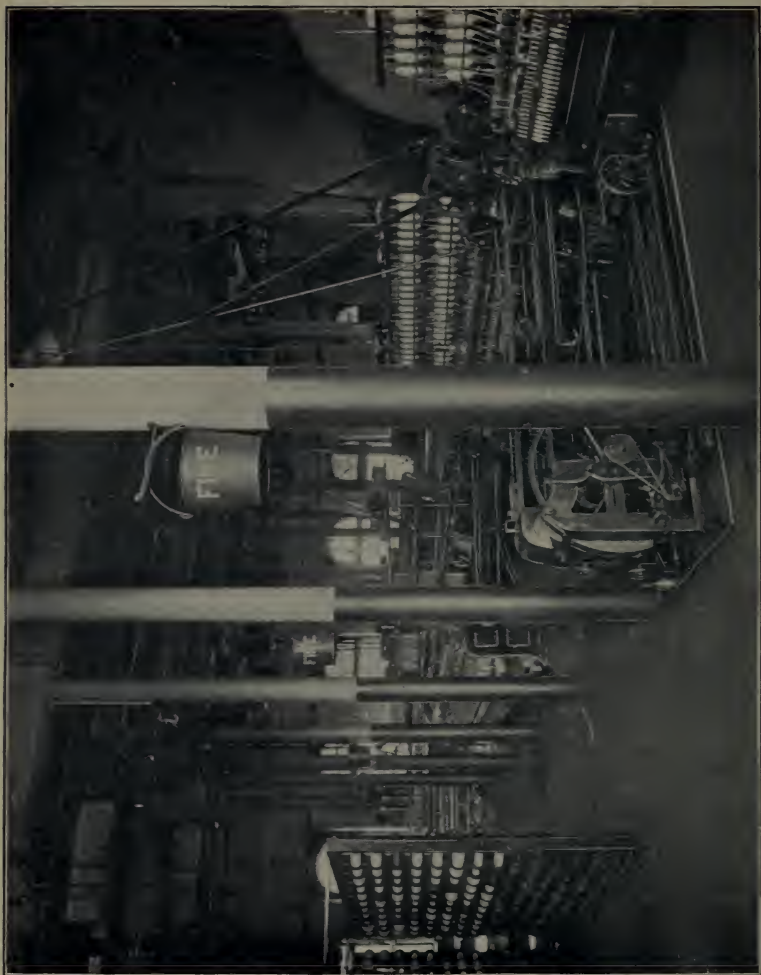
Two Hand Looms, 3 x 3 boxes, with 600 hook jacquard.

One Jacquard piano card cutting machine, from John Royle &
Sons, Paterson, N. J.

The Silk Machinery consists of :—

One Winder, made by the Atwood Machine Co., Stonington, Conn.

One Quiller, made by the Atwood Machine Co., Stonington, Conn.



COTTON MULE.

One Warper, made by the Atwood Machine Co., Stonington, Conn.

One Beamer, made by the Atwood Machine Co., Stonington, Conn.

One Doubling Frame, made by the Atwood Machine Co., Stonington, Conn.

Motive Power, etc.

One 30 horse-power Motor, by the General Electric Co., Schenectady, N. Y.

Two 20 horse-power Motors, made by the Westinghouse Electric and Manufacturing Co., Pittsburgh, Pa.

One 2 1-2 horse-power motor, made by N. E. Motor Co., Lowell, Mass.

One 1 horse-power motor.

One 1-8 horse-power motor.

One complete system of fire protection, including sprinklers, air pressure system, thermostats, and other appliances, by the General Fire Extinguisher Co., Providence, R. I.

One complete humidifying plant, by the American Drosophore Co., Boston, Mass.

One complete humidifying plant by the U. S. Aerophor Air Moistening and Ventilating Co., Providence, R. I.

The Dyeing Department is fully equipped with complete chemical laboratory with individual benches, also small machines for dyeing, and other processes.

Calico printing machines made by Mather & Platt, Oldham, England.

One hydro extractor, from W. H. Tolhurst & Sons, Troy, N. Y.

One jig dyeing machine.

One jacketed iron steaming chamber, from A. Edmeston & Son, Salford, England.

One drying chamber.

One ageing chamber.

One set steam jacketed copper kettles, evaporating benches, etc.

The School is well equipped with reels, balances, electrolytic and other scientific instruments for experimental purposes.

Day Students.

Entrance Qualifications.

Candidates for admission to the day classes may present to the Principal such evidence as may be obtainable, whether degree, diploma or certificate, at any time. For all others, there will be held examinations, as stated in calendar; candidates failing to pass at June examinations will be allowed to try again in September; those who cannot attend the June examinations, may present themselves in September; if conditioned, a further examination will be appointed. Preparation in general will be as follows.

Arithmetic.

Definitions; elementary operations in addition, subtraction, multiplication and division; squares; cubes; square-root; interest. discount; fractions, simple and complex; decimals; percentage; ratio and proportion.

English.

The candidates will be expected to correct examples of bad English, both for spelling, punctuation, capitalization, grammar and sense; also to write a short composition on a given theme (some familiar one), to show a knowledge of language and method of expression.

Geography.

Location of principal countries, with capitals, large rivers, mountains, etc.; noting characteristics of climate, productions and inhabitants. General statements rather than specialization will be sought.

Algebra.

(During 1900 this subject will not be required for entrance, provision being made for it during the first term; but it will doubtless be asked for subsequently.)

Definitions ; fundamental operations, parentheses ; factoring ; highest common factor ; least common multiple ; fractions, simple and complex ; simple equations, one or more unknown quantities ; involution and evolution ; square and cube root ; logarithms.

Application Blank.

A blank form of application may be found at the end of this book.





RING SPINNING AND DRAWING FRAME.

PREPARATORY SCHOOLS.

For those who intend to take Chemistry and Dyeing, physics is almost indispensable; and while the preparation afforded by the modern grammar school will enable the student to complete either of the courses at this school, the increased advantages of the equivalent of a high school training cannot be over-estimated. In such a preparatory course particular attention should be given to algebra, geometry, manual training, chemistry, physics (including mechanics, heat, light and electricity). French and German.

Optional Courses.

During the present year optional courses are offered in advanced algebra, German, Spanish and French at the school.

It will be noted in the regular courses several options are given only one of which is necessarily to be taken.

Advanced Standing.

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular courses may present themselves for examination in such a subject on Friday, September 28, 1900. If a satisfactory rank be attained, they will be given such further work as will be best suited to their advancement.

Fees.

The fee for the day course is \$100 per year for residents of Massachusetts; for non-residents it is \$150 per year.

Five-eighths of the fee is payable on or before Oct. 10, the balance on or before Feb. 10, of each year. After payment is made no fee nor part thereof can be returned.

Special students pay, in general, the full fee; but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, overalls, etc., and pay for any breakage or damage that they cause. The above fee includes free admission to any of the evening classes in which there is accommodation should any day student desire to attend.

A deposit of \$15 will be required to cover the cost of breakage in the chemical laboratory, the unexpended balance to be returned to the student at the end of the year.

The fees for the evening classes vary and are indicated elsewhere.

Fees are strictly payable in advance and no student will be admitted to the classes until his fees are paid and he has filed an attendance card.

Examinations.

Examinations will be held at the end of each term.

Students who do not show sufficiently satisfactory progress in the final examinations at the end of the first year will not be admitted to the second year classes, and the same applies to second year students, with reference to their admission to the third year class.

Intermediate examinations will be held, which will serve to inform the student as to progress made or lack of it, and may be appointed at any time.

In general the examinations will cover the work of the preceding term but at the end of the third year, candidates for diplomas may be examined on all preceding work.

Daily work and regularity of attendance will also be considered in making up the reports of standing.

Reports of Standing.

Twice during each term informal reports are sent to students, or to guardians of such as are not of age; and at the end of each term formal reports are made.

Attendance Card.

At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as he may choose, subject to the approval

of the Principal. When an attendance card is once approved no change can be made except through the Principal.

Thesis

All candidates for the diploma of the school, must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper 8 x 10, with 1 inch margin at left and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete either of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged.

Diploma

The diploma of the School is awarded upon the satisfactory completion of either of the five regular courses, covering not less than three years except where entrance is to advanced standing. In such cases at least one year's residence will be required.

Certificate

For the satisfactory completion of a three year's course in any special department, the certificate of the school will be awarded; but at least one year's attendance will be required, if the candidate be passed to advanced standing.

Payments

All payments should be made to Wm. W. Crosby, Principal. If by check, remittance from points outside of New England should be in Boston funds.



WORSTED CARD.

Conduct

Day students will be expected to attend all lectures, classes and demonstrations of practical work, except when permission to be absent has been obtained from the Principal. In cases of sickness, or other unavoidable absence, written explanation must be sent. When specially required by parents, cases of absence will be reported daily.

Books will be prescribed for study and for entry of lecture notes and other exercises, and will be periodically examined by the lecturers. The care and accuracy with which these books are kept will be considered in awarding marks.

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order.

In the cases of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct, or general insubordination, will be considered good and sufficient reasons for the suspension of a student by the Principal, and for his subsequent removal from the School and forfeiture of all school privileges, if the President of the School so decides.

Apparatus used in the Dyeing or Chemical Laboratory will be provided by the School, but a deposit must be made by the student at the beginning of the term sufficient to cover its cost, and this deposit will be returned to him at the close of the term, subject to such deduction as will reimburse the School for broken or damaged articles.

Library

The School Library is supplied with all the leading textile books and with works dealing with science, art or industries allied to the textile trades. The leading textile trade papers are kept on file.

Sessions

The regular school sessions will be in general from 9 A. M. till 1

P. M., and from 2.15 to 5 P. M., except Saturdays when the building will be closed in the afternoon.

A schedule will be prepared showing the time to be devoted to each subject and the hours at which the various classes meet. This will be rigidly adhered to and the register will be marked for each lecture or demonstration.

General

Students from a distance, requiring rooms and board in the city, may, if they desire it, select the same from a list of houses which is kept at the School. The cost of rooms and board in a good district is from \$4 per week upwards.

All raw stock and yarn will be provided by the School and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student will be allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated as prescribed by the Principal, and facilities will be given for the preparation of a collection of such fabrics as are produced in the School, with all the instruction for their manufacture. It is understood that the Trustees may retain in the School such other specimens of students' work as the Principal may determine.

Prospective students who are desirous of arranging special courses by omitting a portion of one course, adding a portion of another, or in any other way, are invited to communicate with the Principal.

An additional entrance examination to suit the convenience of students from a distance (out of New England), will be arranged.

Lock boxes will be provided for the use of the students, sufficiently capacious to contain clothing, books and tools. A deposit will be required which will be returned to the student upon the surrender of the locker key.

No books, instruments, or other property of the School will be loaned to the students, or allowed to be removed from the premises.

Facilities will be given for visits by day students to New England mills and works during the session.

Materials.

Students must purchase such tools, instruments, text books and apparatus as may from time to time be recommended by the head of each department, and the cost of these for day students will be from \$10.00 to \$15.00, and for evening students from \$2.00 upwards, according to the subject studied.

The Regular Courses.

The title of each of the regular courses is an indication of the particular nature of the course unless it be in the case of Course III. There is a considerable demand for a general textile course in which the whole subject may be treated broadly; this course is organized with this particular object in view although various options are offered, in which some one branch may be followed at length.

Certain general studies are included in each course in order that in specializing, a too narrow view may be avoided; for in this branch of the world's industries, there have been too many short sighted policies in the past, and it is to be hoped that the broadening influence of the textile school may help to usher in a new era.

Special Courses.

While it is always urged that regular courses be followed if possible, there is opportunity to make special arrangements, to fit for particular positions as for example:—yarn mill, weaving special fabrics, designing etc., and, owing to the large number of possibilities those desiring such courses are invited to correspond with the Principal.



WOOLEN CARDS.

Courses of Instruction, Day Classes.

[For details of the several subjects see subsequent page]

FIRST YEAR,—FIRST TERM.

Design Construction.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Elements of Mechanism.	General Chemistry.
Mechanical Drawing.	Freehand Drawing.

Common to all courses.

Course I.—Cotton Manufacturing.

First Year.—First Term. (Common to all courses, see above.)

FIRST YEAR.—SECOND TERM.

Cotton Fibre.	Cotton Manipulation.
Design Construction.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Elements of Mechanism.	General Chemistry.
Mechanical Drawing.	Freehand Drawing.

SECOND YEAR.—FIRST TERM.

Cotton Manipulation.	Applied Mechanics.
Machine Drawing.	Warp Preparation.
Textile Chemistry and Dyeing.	Weaving.
Designing.	Cloth Analysis.

Hand Looms.

SECOND YEAR.—SECOND TERM.

Cotton Manipulation.	Applied Mechanics.
Machine Drawing.	Weaving.
Textile Chemistry and Dyeing.	Designing.
Cloth Analysis.	Hand Looms.

THIRD YEAR.

Cotton Manipulation.	Designing.
Weaving.	Mill Engineering.

Thesis.

Course II.—Wool Manufacturing.

First Year.—First Term. (Common to all courses see page 38)

FIRST YEAR.—SECOND TERM.

Wool Fibre.	Woolen Spinning.
Microscopic Examination of Fibres.	
Design Construction.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Elements of Mechanism.	General Chemistry.
Mechanical Drawing.	Freehand Drawing.

SECOND YEAR.—FIRST TERM.

Woolen Spinning.	Applied Mechanics.
Machine Drawing.	Warp Preparation.
Weaving.	Designing.

Textile Chemistry and Dyeing.

Cloth Analysis.	Hand Looms.
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SECOND TERM.

Worsted Spinning.	Applied Mechanics.
Machine Drawing.	Weaving.
Textile Chemistry and Dyeing	Designing.
Cloth Analysis.	Hand Looms.

THIRD YEAR.

Wool Manipulation.	Designing.
Weaving.	Mill Engineering.

Thesis.

Course III.—Designing.

First Year.—First Term. (Common to all courses, see page 38)

FIRST YEAR.—SECOND TERM.

Design Construction.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Design Sketching.	Freehand Drawing.
Mechanical Drawing.	General Chemistry.

Elements of Mechanism.

Options :

Woolen and Worsted Spinning. Cotton Spinning.

SECOND YEAR.

Design Construction.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Design Sketching and Jacquard Work.	
Decorative Art.	Weaving.
Textile Chemistry and Dyeing	Applied Mechanics.
Options :	
Woolen and Worsted Spinning.	Cotton Spinning.

THIRD YEAR.

Designing — Advanced Work.	Weaving.
Mill Engineering	Thesis.
Options :	
Decorative Art.	Woolen and Worsted Spinning.
Cotton Spinning.	Mill Engineering.

Course IV.—Chemistry and Dyeing.

First Year.—First Term. (Common to all courses, see page 38)

FIRST YEAR—SECOND TERM.

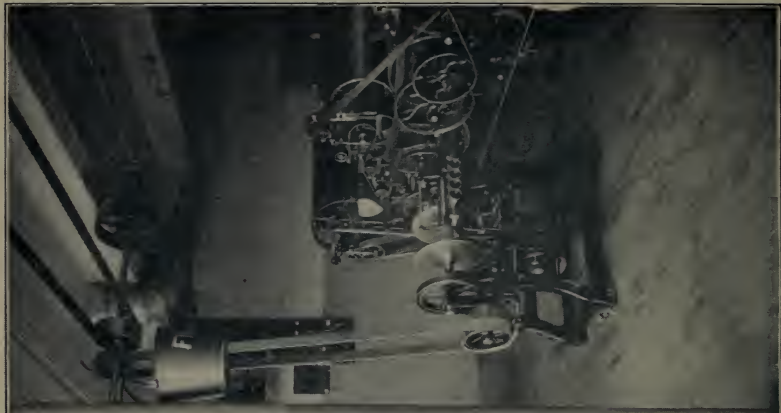
General Chemistry.	Qualitative Analysis.
Stoichiometry.	Mechanical Drawing.
Elements of Mechanism.	Designing.
Cloth Analysis.	Hand Looms.

SECOND YEAR.

Textile Chemistry and Dyeing.	Advanced Inorganic Chemistry.
Chemical Philosophy.	Organic Chemistry.
Applied Mechanics.	
Options :	
Designing.	Weaving.

THIRD YEAR.

Quantitative Analysis.	Industrial Chemistry.
Advanced Textile Chemistry and Dyeing.	
Dye Testing.	Microscopy.
Thesis.	
Options :	
Weaving.	Mill Engineering.



WORSTED COMB AND BALLING BOX.

Course V.—Weaving.

First Year.—First Term. (Common to all courses, see page 38)

FIRST YEAR.—SECOND TERM.

Design Construction.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Freehand Drawing.	Mechanical Drawing.
Elements of Mechanism.	General Chemistry.

Options :

Woolen and Worsted Spinning. Cotton Spinning.

SECOND YEAR.

Design Construction.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Decorative Art.	Loom Construction.
Textile Chemistry and Dyeing.	Weaving.

Applied Mechanics.

Options :

Woolen and Worsted Spinning. Cotton Spinning.

THIRD YEAR.

Fabric Structure.	Cloth Construction.
Cloth Analysis.	Hand Looms.
Analysis of Weaving Mechanism.	
Weaving.	Thesis.

Mill Engineering.

Cotton Spinning Department.

First Year.

1. The Cotton Fibre.
- Cotton Selection.
- Classification of cotton.
- Varieties of cotton from different parts of the world.
- The Cotton Gin.
- Hand and Mechanical methods of mixing and distributing cotton from the bale.
- The construction of the Automatic Feeder.
- The construction of the Opener.

- The construction of the Breaker.
- The construction of the Intermediate and Finisher Lappers.
- The operation and care of Picking Machinery.
- Theory of Carding and Development of Carding Machinery.
- The Stationary Top Card.
- The Revolving Top Card.
- Card Grinding, Setting, Stripping, and care of Cards.
- 2. Operation of above machines.
- 3. Calculations connected with the machines named above.

Second Year.

- 1. Construction and use of the Railway Head.
- Principle of Drawing processes.
- Construction and care of the Drawing Frame.
- The development of the Fly Frame.
- The construction and use of the Slubbing Frame.
- The construction and use of the Intermediate Frame.
- The construction and use of the Fine Frame.
- The operation and care of the Flyer Frames.
- The construction and use of the Ring Spinning Frame.
- 2. Operation of above named machines.
- 3. Calculations connected with the above machines.

Third Year.

- Construction and use of the Cotton Comb.
- Construction and use of the Sliver Lap Machine.
- Construction and use of the Ribbon Lap Machine.
- The operation and care of Combing Machinery.
- The construction and use of the Spinning Mule.
- The construction and use of the Spooler.
- The construction and use of the Warper.
- The construction and use of the Slasher.
- Drawing-in.
- 2. List of machinery adapted for different purposes in Cotton Mill Work.
- Layout of machinery for different processes.

Woolen and Worsted Spinning Department.

WOOLEN SPINNING.

First Year.—Second Term.

Lecture Course:

Animal and Vegetable Fbres.

Discussion of the various kinds Wool and their Spinning qualities.

Wool Sorting.

Manufacture and use of Shoddies, Mungoes, Extracts, Flocks and Noils.

Wool Washing, including the construction and uses of Washing Machines and Hydro-Extractors, and materials used as Detergents.

Carbonization, Wet and Dry Process.

The Solvent Process for cleansing Wool.

Construction and uses of Dryers (Table and Artificial).

Shrinkage of Wool in Washing.

Construction and uses of the several kinds of Pickers, Burring and Garnetting Machines.

Picking, Mixing, Blending and Oiling.

Kinds and quantities of Oil. Testing.

Principles of Carding.

Carding on the First Breaker, Second Breaker and Finisher.

Condensers.—Single and Double Doffers, etc.

Setting and uses of the various parts of the Card.

The various kinds of Feed.—Hand, Bramwell, Apperly, Camel-back, Torrance Balling Head and Creel, etc.

Card Clothing,—various kinds of Backing (Leather, Linen, Flexi-fort, etc). Kinds and sizes of Wire; Garnett Wire.

Method of counting Card Clothing (counts and crowns).

Setting up Cards, turning up Cylinders, clothing the Card, Grinding Speeds, Production, etc.



WORSTED MACHINERY.

Second Year.—First Term.

Principles of Spinning.

History and development.

Hand Jack. Self-operating and Self-acting Mules.

The Mule-head.

Method of driving the various parts. Rolls. Spind'es. Carriage. etc.

Backing-off.

Winding Mechanism.

Study of the Quadrant and Builder-rail.

Regulation of the Fallers.

Double Spinning.

Twisting on Mule and on Woolen Twister.

With the above lectures will be given all the necessary calculations and actual practice on the various machines.

WORSTED SPINNING.

Second Year.—Second Term.

Lecture course :

The difference between a Worsted and a Woolen Thread.

Carding.

Preparing.

What wools are Prepared and why they are not Carded.

Doubling and Back Washing,—the nature of these processes.

The principles, history and development of Combing.

Combing on the Noble. Lister, Holden and Little & Eastwood Machines.

Pin Setting.

Gilling and Top Making.

The hygroscopic property of Wool.

Conditioning of Tops.

Principles of Drawing.

Construction of the Drawing and Roving Frames.

Drawing on the Open, Cone and French Systems.

Study of the Drag.

Stop Motions.

Construction and uses of Gauge Points.

Principles of Spinning.

Spinning on the Cap, Flyer and Ring Frames.

Worsted Mule Spinning.

Types of Frames (Leicester and Illingworth).

Spinning of Carpet, Braid and Botany yarns.

The system of counting Worsted yarns.

Doubling and Twisting, including the construction and uses of the various kinds of Twisters.

Winding, Hanking, Balling and Bundling.

Yarn Testing, etc.

The above lectures include all the necessary calculations and actual practice on the various machines.

Third Year.

Manufacture of fancy yarns.

Fancy mixed yarns.

Woolen and cotton.

Woolen and Silk.

Woolen and worsted.

Union yarns, (Worsted and Cotton).

Two, three and more ply, fancy twists.

Fancy knotted yarns, Knickerbocker, etc.

Loop, Slub and Mottled yarns.

Color as applied to fancy yarns.

Layout of machinery for different processes.

Humidifying and Humidifiers.

Production and Costs.

Designing Department.

GENERAL COURSE.

First Year.

1. Course of lectures on cloth construction and designing in Cotton, Woolen, Worsted, Silk, Linen, etc.

Classifications of fabrics.

Plain fabrics and fabrics on a plain cloth basis.

Names and explanations of different parts of cloth and terms applied to weaves, etc. Point or design paper.

Methods of representing weaves, drafts, etc., on paper.

Explanation of harness and chain drafts.

Twill cloth and combination of same.

Broken twills.

Sateens.

Combination of weaves.

Figured weaving on plain ground.

Diapers, coatings, trouserings.

Colored goods, stripes.

Checked goods.

2. Practical work and lessons on cloth analysis and reproduction of fabrics, one on planning patterns, drafts, etc., on paper, including yarn and cloth calculations, as below.

3. Practical work on hand looms, putting into operation the principles taught in the foregoing course.

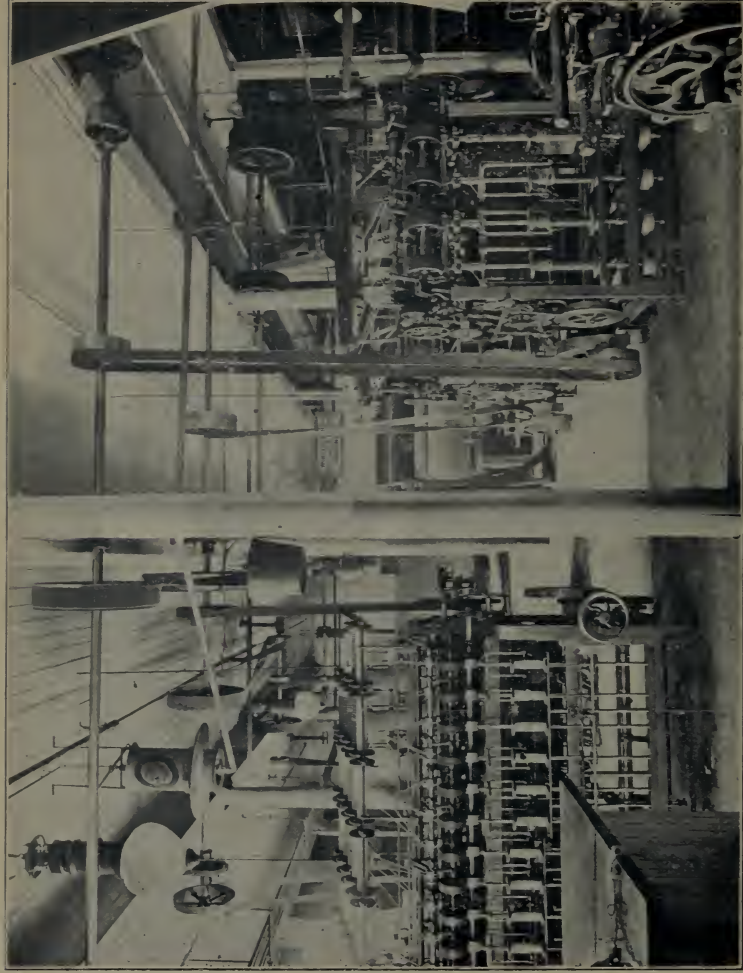
Yarn and cloth calculations.

4. The uses of textile calculations, methods of naming or counting cotton, worsted and linen yarns.

Methods of naming woolen yarns.

Methods of naming silk yarns.

Comparative calculations for converting one system of yarns into that of another.



WORSTED MACHINERY.

Calculations for folded or ply yarns.

Calculations to find weight, count or length of warp, from given data.

Calculations for reeds.

Calculations for harness, straight, centered, or pointed draft.

Calculations for harness, spaced and in combinations.

Calculations for shrinkage, or contraction.

Calculations for quantities of material to make plain and striped warps.

Calculations for the quantities of material required to make plain and checked fabrics.

Calculations to find the number of ends per inch in order to use a given weight of warp, also picks per inch to use a given weight of filling.

Calculations on the proportioning of fabrics.

Practical lessons in color effects.

Combinations of colored threads.

Color definition.

Color nomenclature.

Second Year.

Lecture Course:

Construction of Cloth.

Balance of Cloth.

Cloth made with or ornamented by extra warp.

Cloth made with or ornamented by extra filling.

Double and Triple Cloths.

Cotton, Fancy Sateen Stripes.

Cotton Velvets.

Cotton Plushes.

Cotton Pile fabrics, cut and uncut.

Color and color effects.

Color definition.

Color nomenclature.

Fancy Woolen Cassimeres.

Trouserings. Suitings and Coatings.
Figured Matelasses.
Worsted and Mohair Mantle Cloths.
Figured Blankets.
Carriage Robes.
Shawls.
Figured double plain.
Reversibles.

Practical work and lessons on cloth analysis and reproduction of fabrics, and on planning patterns, drafts, chains, etc., on paper, including all necessary calculations.

Amount of material required for laying out lots for mixes and twisted yarns.

Amount of material used in the construction of fabrics, analysis to consist of Cotton Dress Goods, Gingham and Fancy Weave Dress Goods.

Fancy Woolen and Worsted Cassimeres.
Woolen and Worsted Suitings.
Woolen and Worsted Tricots.
Overcoatings.

Double Cloth and Ingrain Carpets.

Practical work on hand looms, putting into operation the principles taught in the foregoing course.

Third Year Course.

Lecture course :

Cotton Gauze.

.. Leno.

.. Lappet.

Jacquard Designing.

Casting out.

Distribution of Patterns.

Determination of areas occupied by the figures.

Jacquard figures formed with warp.

Jacquard figures with filling.

Figures not square.

The principles of designing, cloth structure and coloring best adapted to each of the above fabrics.

Cloth formed by the combination of Jacquard gauze and fancy harness weaves.

Jacquard pile and ordinary weaves.

Special designs for Jacquard gauze, and pile fabrics.

Vestings, quiltings, lappet, gauze and fancy pile fabrics.

Analysis.

The structure and analysis of all descriptions of compound fabrics viz :— backed, double, and various types of Jacquard figured fabrics, specially applicable to the Cotton and Worsted industries.

Calculations necessary in determining the departmental and total cost of production of any fabric from given data of values of materials, labor, etc., by ascertaining the fibre, counts, threads, picks, weight, shrinkage, etc.

Hand and power loom practice, putting into operation the principles taught in the foregoing course.

FINISHING.

Processes of finishing :—such as perching, mending, burling, inspecting and numbering.

Scouring and Fulling.

Wet and Dry Finishing.

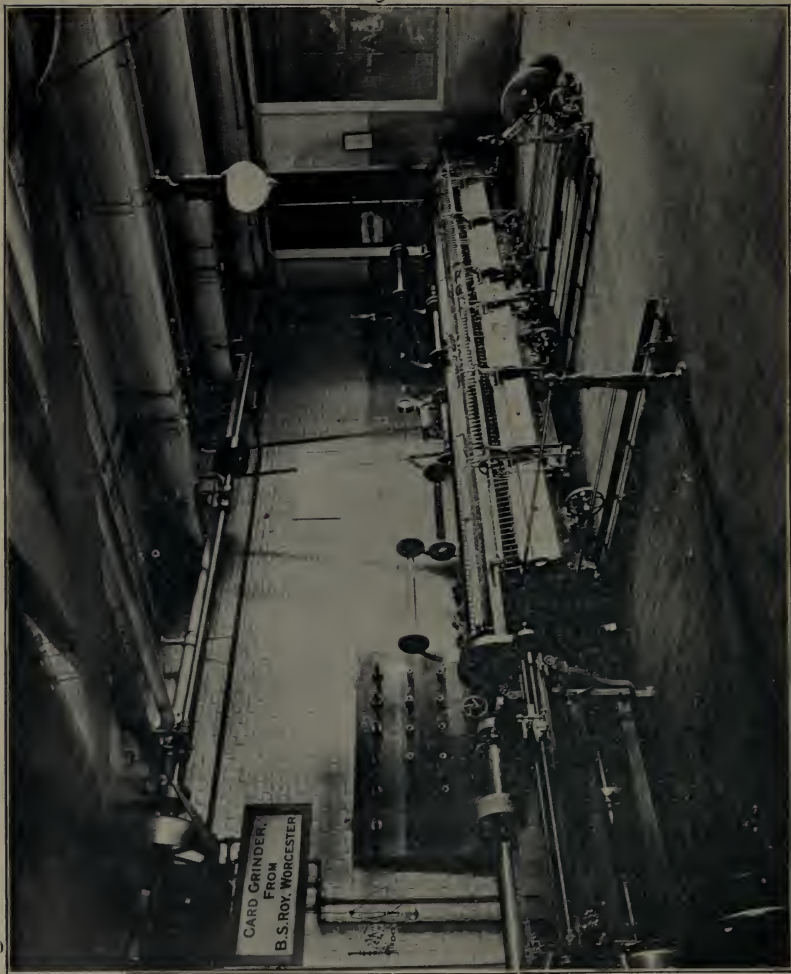
Gigging, Wire Teazle Gigs and Wrappers.

Steaming, Shearing, Brushing and Napping.

Rotary and Hydraulic Pressing.

Measuring and Rolling.

Process of Finishing Worsted Cassimeres, Cheviots, Beavers, Meltons, Chinchillas, Dress goods, etc.



WOOLEN MULE.

Weaving Department.

First Year.

1. Process of making pattern warps.
The construction and use of Spooling and Quilling Machinery for wool and cotton.
The construction and use of Warpers of various kinds.
The Woolen Sizing Machine.
The Woolen Beamer.
Sizing materials and size mixing machinery.
Long and short chain systems of preparing warps and filling.
Drawing-in and twisting.
Operation of machines named above, and warp preparation in cotton, woolen and worsted, silk and linen, timed to correspond with the respective lectures.

Second Year.

1. The plain power loom and its construction.
Shedding by cams.
Various pickers and picking motions.
Fast and loose reeds.
Take up and let off motions.
Minor adjustments of the power loom.
Plain looms as altered for weaving fancy cloth.
Looms constructed for several shuttles.
Drop box motions.
Shedding motions.
Single acting dobbies.
Double acting dobbies.
Spring boxes and other motions for returning harness.
Chain building for dobbies.
Chain building for box looms.
Various handkerchief motions.
Lappet motions.

Towel and other pile cloth weaving.

Open and close shed looms.

2. Practical work on the above looms, including teaching the student to weave, and fix looms.

Also pulling down looms and rebuilding same, including timing and setting.

This work will be arranged to correspond with the respective lectures.

3. Lessons on calculations applied to the machines and processes named above.

Third Year.

1. Lectures on Jacquard machinery.

Gauze and Leno weaving.

Single lift Jacquards.

Double lift Jacquards.

Leno Jacquards.

Jacquards specially arranged for ingrain carpet work.

Tapestry weaving, quilt weaving, and so on.

Weave room, engineering and equipment.

Cost of weave mill operation and statistics of operations.

Finishing Department :

Knotting and burling.

Fulling, construction of the several kinds of fulling machines.

Gigging, construction of the gig.

Shearing, construction of the shear.

Pressing, construction of the several kinds of presses.

Measuring and weighing, ticketing, numbering and rolling.

Cloth folders.

Cloth brushes.

Baling and casing of cloth for shipment.

Decorative Art Department.

The close relation Decorative Art bears to the textile industry requires the organization of a Decorative Art Department.

While it is the special object of the School to give instruction in this department of such a character as to develop a knowledge of the laws of decoration and theory of design as applied to textile fabrics of every kind, it is also true that the fundamental instruction necessary for this is similar to that required for other branches of decorative art, so that students not necessarily intending to follow textile manufacturing are invited and may attend with advantage.

Special arrangements have been made to form classes in free-hand drawing and decoration, for the purpose of giving the students general instruction in the theory and practice of decorative art, the instruction afterwards to be devoted to the special branch the student desires to follow. The school will thus fulfill the object of preparing the student in practical designing in any of the branches of decorative art, with special regard to fabrics.

Decoration.

The class in decoration and design is for the purpose of teaching the principles that enter into every species of design and while it is intended especially for fabrics, jacquard, damasks, carpets, tablecloths, etc., it is equally applicable to any branch of Decorative Art, and would include the designing of wall paper, book covers, silver, interior decoration, etc., etc.

The fee for the course will be \$15.00 per term.

Class in Drawing, Painting and Composition.

This class will be for the benefit of those wishing to become painters, decorators, or illustrators.

In this class drawing, painting and composition will be taught, and later, should the size of the class warrant it, drawing from the model will be introduced.

This class will be modelled after the Julian Academy of Paris.

Professor George's long experience abroad and in years of teaching in Boston makes this an exceptional opportunity for the students wishing to avail themselves of it.

In the new building about to be erected studios are planned for this purpose.

The classes will be in session Tuesdays and Thursdays from 9 to 12 and 2 to 4, and Saturday from 9 to 12.





DESIGN CLASS ROOM.

Department of Mechanics.

First Year.

Lecture Course:	Elements of Mechanism:
Definitions.	Force and Work, Measurement of
Screw.	Worm and Wheel.
Pulley Blocks.	Inclined Plane and Wedge.
Rolling Cylinders and Cones.	Gearing, Spur and Friction.
Flexible Connectors.	Belts.
Cords.	Chains.
Levers.	Theory and Design.
Cams.	Wipers.
Toggle Joints.	Quick Return Motions.
Harmonic Motion.	Wheels in Trains.
Mangle Wheels.	Aggregate Combinations.
Differential Pulleys.	Epicyclic Train Compounds.

Disc and Roller.

Elements of Thermodynamics as applied to steam.

Motive Powers:

Water.	Steam.
Electricity.	Gas.
Measurement of power.	Dynamometers.
Pressure and impulse wheels.	Turbines.

In-flow, out-flow, upward and mixed.

Suction and draft tubes.

Flow of water, quantity and power.

Water meters. Governors.

Steam engine:

Simple, compound and triple expansion.

Slide Valve Gear:

Double ported, Corliss and Cam.

Condensing engines.

Coal consumption.

Use of exhaust steam for heating and dye-house purposes.

Indicator:

Construction of and use in measuring power and setting valves.

Practical use of indicator and computation of indicator diagrams.

Governors, throttling and cut-off.

Economy and Costs.

Electric current :

Ohm, ampere, volt and watt.

Ohm's law.

Law of Lenz.

Direct and alternating currents.

Magnetism.

Induction.

Simple, series, shunt, and compound windings.

Transformers.

Adaptability of current to mill purposes, light, power and heat.

Transmission.

Economy.

Gas engine theory:

Throttling type,

Hit and miss type.

Heat units in gas.

Governing devices.

Mechanical Drawing:

Care and use of Instruments.

Geometrical Constructions.

Elements of Projections.

Isometric Drawings.

Perspective Drawing.

Working Drawings.

Blue Print Process.

Second Year.

Applied Mechanics.

Strength of Materials.

In the above topics will be included as many problems as possible, dealing with the construction of and maintenance of mills, not with the purpose of educating mill engineers. but rather to familiarize the student with the means at hand and processes employed in erecting structures for manufacturing, that they may study their government more advantageously.



DRAWING-IN FRAME.

Machine Drawing.

Practical sketching from machines. both for mechanism construction and detail and assembly drawing.

Third Year.

Mill Construction.

Mill Ventilation.

“ Humidifying.

“ Warming.

“ Maintenance.

“ Fire Protection.

Several courses of lectures on allied subjects by outside lecturers will be added.

Languages.

A department of modern languages has been established at the School; students of the school are offered either of these courses at a charge of \$5 for 20 lessons.

Others who may desire to avail themselves of these language courses, without taking other courses, may do so at a charge of \$8 for 20 lessons.

In general the classes will meet after four o'clock in the afternoon.

Announcement of the classes, and further information may be had by addressing the Principal.

General Lectures.

Lectures on the various branches and specialties of the textile business will be given from time to time. Among the subjects will be Patent Law; Fire Protection; Mill Costs; Finishing; Power, Heat and Light.



EVENING CLASSES.

The courses of instruction offered in the evening are identical with those of the day, with the exception that less time is devoted to the machine work, since, in most cases this is of small moment; ordinarily the handling of the machinery is a part familiar to most of the students through contact with it in the day time, and in such cases the explanations and calculations are of the greater importance. In some cases it is possible to pursue two courses together, but this depends a ways on the arrangement of the schedule for any particular year.

The evening courses are free to graduates of the Evening High and Drawing Schools, operatives of the mills and machine shops, and other residents of Lowell, to such numbers as may be accommodated in the various classes. Applications will be considered in the order in which they are received.

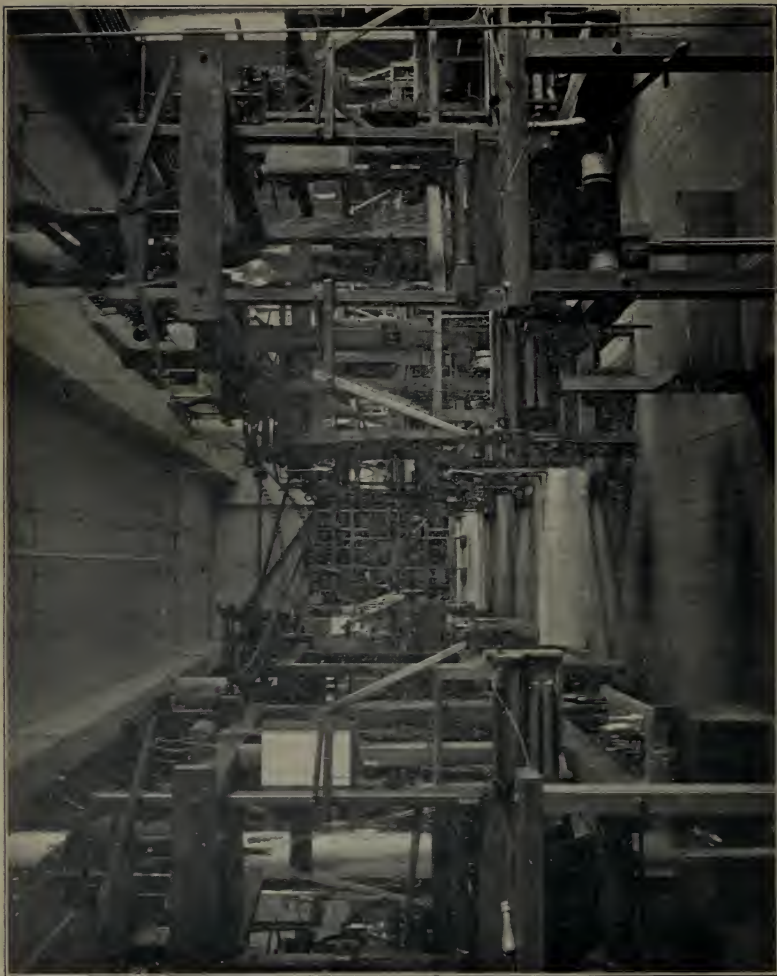
The requirements for admission to the Evening Classes are similar to those for the Day. Graduates of other schools, will be received on presentation of proper credentials; for all others, examinations will be held on Thursday, Sept. 27, at 7 P. M. at the School. The candidates must be familiar with the English language, and the principles of arithmetic; for the first part, a short composition must be written on a given theme, while in the latter will be included addition, decimals, fractions, percentage, ratio and proportion.

Subjects.

The list of subjects embraced in each course is identical with that of the day and may be found beginning at page 38.

Certificate.

With the honorable and satisfactory completion of either of the regular evening courses in any subject, the certificate of the School will be awarded.



HAND LOOMS.

Course I, Cotton Spinning.—3 Years.

Fee for all except residents of Lowell, \$2.50 per term. \$5.00 per year.

Course II, [A] Woolen Spinning.—1 Year.

Course II, [B] Worsted Spinning.—2 Years.

Fee for all except residents of Lowell, \$2.50 per term. \$5.00 per year.

Course III, Designing —3 Years.

Fee for all except residents of Lowell, \$5.00 per term. \$10.00 per year.

Course IV, Chemistry and Dyeing.—3 Years.

Fee for all except residents of Lowell, \$5.00 per term. \$10.00 per year. A deposit of \$5 will be required from all who take this course, whether residents of Lowell, or not, to cover the cost of laboratory breakages; at the end of the year any unexpended balance will be returned, or an extra charge made, as the case may be.

Course V, Warp Preparation and Weaving—3 Years.

Fee for all except residents of Lowell, \$2.50 per term. \$5.00 per year.

Course VI, Mechanical Engineering,—2 Years.

Fee \$2.50 per term. Free to residents of Lowell.

General.

The schedule showing the arrangements of classes for each term will be announced at the opening of each term.





PEG WARPING.

Chemistry and Dyeing Department.

The regular course in Chemistry and Dyeing for day students extends through three entire school years, and is especially recommended to those who intend to enter any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry.

In addition to acquiring a thorough knowledge of the principles of all branches of dyeing, printing, bleaching, etc., the student by application, study, and conscientious performance of all the prescribed laboratory and practical work, should become efficient in the subject of Textile Chemistry, and the methods of testing the various dyestuffs, mordants, etc.

In this course the following subjects are presented.

GENERAL CHEMISTRY.

This subject is required of all students taking the regular course in Chemistry and Dyeing and all others intending to take up the study of Textile Chemistry and Dyeing later.

It will include lectures, recitations, and a large amount of individual laboratory work upon the following subjects, and will extend through one entire school year :—

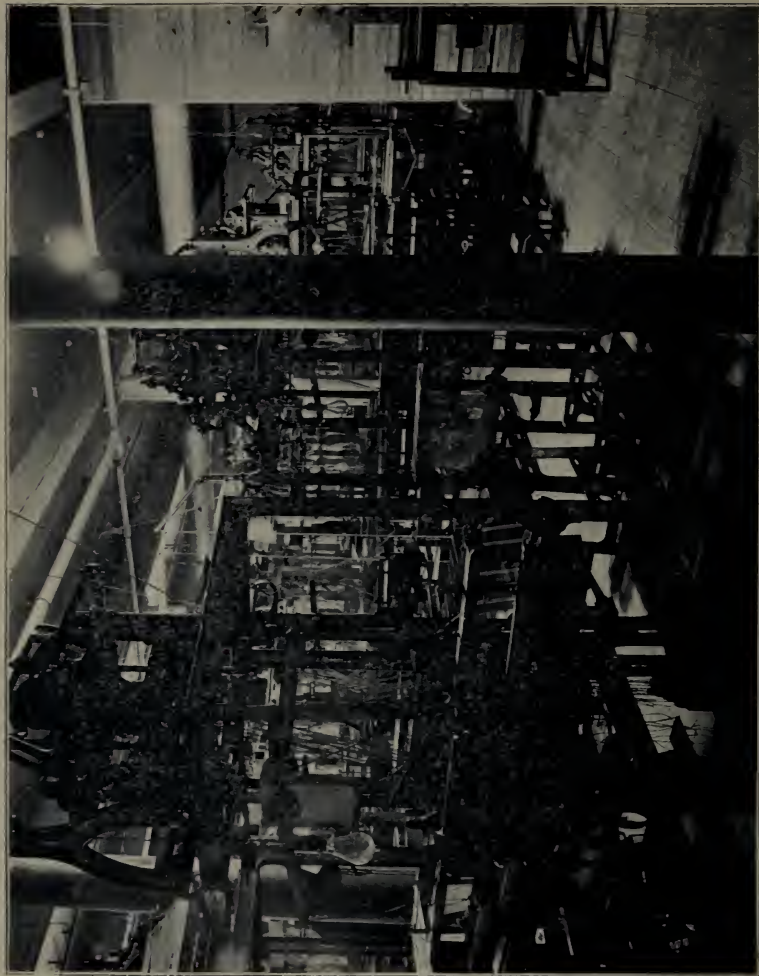
Chemical Philosophy.—Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-Metallic Elements.—Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements.—Study of their occurrence, properties, metallurgy, chemical compounds, etc.

The Hydrocarbons and their Derivatives.—Study of their occurrence, properties, preparation, uses, etc.

Qualitative Analysis.—Before the completion of the course, the



HAND LOOMS.

students will take up, as thoroughly as the time will permit, the qualitative detection of the more common metals and non-metals, with practical work.

No pains will be spared in giving the student a thorough training in fundamental principles of the science.

The course will consist of sixty hours of lectures and recitations, and one hundred and twenty hours of laboratory work, but those taking Course IV will take more than double this amount of work.

QUALITATIVE ANALYSIS.

Qualitative analysis will be studied by the students taking the regular Chemistry and Dyeing course during the second term of the first year.

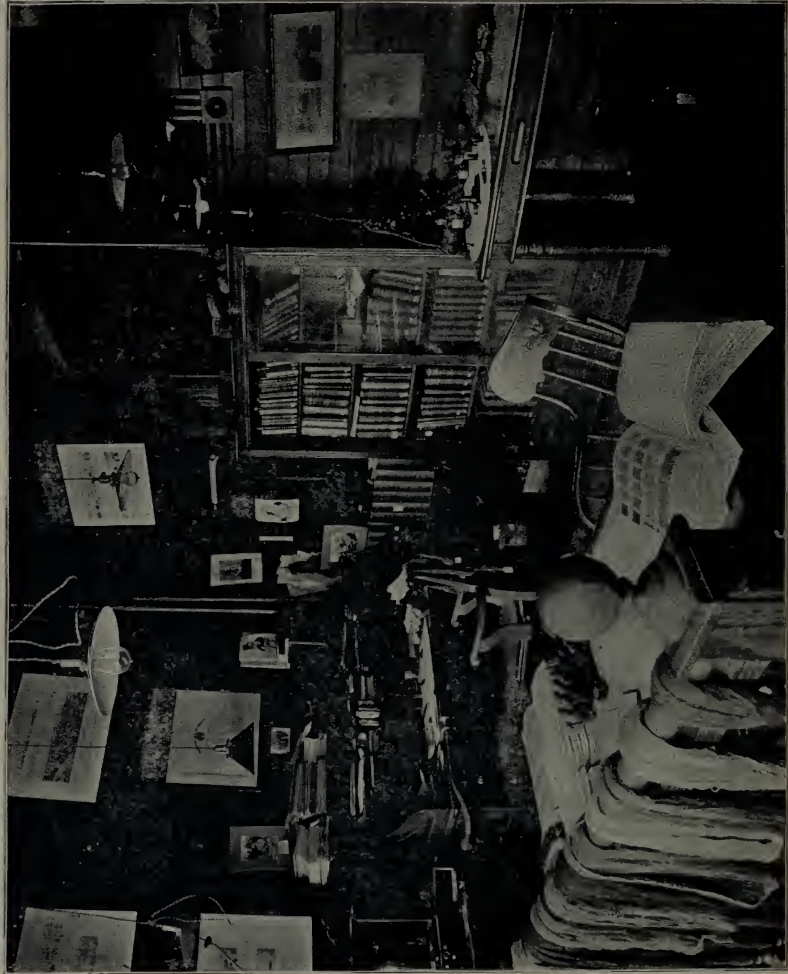
The subject is taught in a thorough manner, and in addition to lectures and recitations, at least fifteen hours per week of laboratory work will be required, and before completing the course, in addition to a large amount of preliminary laboratory work, each student must satisfactorily analyze at least 30 solutions and 10 solids containing any of the common metals and acids, and six alloys containing any of the common metals. At the close of the course, each student will be required to pass a written examination upon the subject, as well as a practical examination involving the analysis of a solution and a solid, each of which will contain at least ten of the common metals and acids.

STOICHIOMETRY.

This subject will be taken up by the chemistry and dyeing students during the second term of the first year. Special attention will be paid to the writing of the chemical equations, representing the chemical reactions involved in the qualitative analysis. The application of the metric system will be carefully studied; as well as the different thermometric and specific gravity scales; and problems will be worked by the students involving the expansion and contraction of glass, determination of percentage composition of chemical compounds, etc.

TEXTILE CHEMISTRY AND DYEING.

Under this head is included first the lecture course in Textile



CHEMISTRY DEPARTMENT OFFICE.

Chemistry and Dyeing, which is taken by all regular diploma students, and second the laboratory and practical work course which will be taken by the regular Chemistry and Dyeing or Course IV students.

OUTLINE OF LECTURE COURSE.

Technology of Vegetable Fibers.—Cotton, linen, jute, hemp, China grass, etc. Chemical and physical properties, chemical composition, microscopical study, action of chemicals, acids, alkalies, heat, etc.

Technology of Animal Fibers—Wool, silk, etc. Chemical and physical properties, chemical composition, microscopical study, action of chemicals, acids, alkalies, heat, etc.

Operations Preliminary to Dyeing.—Bleaching of cotton and linen, wool scouring, bleaching, fulling and felting, silk scouring and bleaching, action of soaps.

Water and its Application in the Textile Industry.—Impurities present, the methods of their detection, their effect during different operations, and methods for their removal or correction.

Mordants and other Chemical Compounds used in textile coloring not classed as dyestuffs.—Theory of mordants, their chemical properties and their application, aluminium mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, sulphated oil, fixing agents, leveling agents, assistants, etc.

Theory of Dyeing.—Chemical, mechanical, solution, etc.

Natural Coloring Matters.—Origin, properties, application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, tumeric, madder, quercitron bark, Persian berries, etc.

Artificial Coloring Matters.—General discussion of their history, nature, source, methods of manufacture, and methods of classification:

Special study of:—

Direct Cotton Colors.

Basic Coloring Matters.

Acid Dyestuffs.

Phthalic Anhydride Colors, including the eosins, rhodamines, phloxines, etc.



CHEMISTRY LECTURE ROOM.

Alizarine Colors, including other artificial coloring matters requiring a metallic mordant.

Insoluble Azo Colors, developed on the fibre.

Aniline Black, artificial indigo, and other artificial dyestuffs not coming under the above heads.

Machinery used in Dyeing.—A certain amount of time will be devoted to the description of the machinery used in the various processes of textile coloring and this will be supplemented as far as possible by the use of charts, diagrams, lantern slides, etc.

OUTLINE OF LABORATORY AND PRACTICAL WORK COURSE.

Besides lectures and recitations upon this subject, those taking the regular day course in Chemistry and Dyeing will be required to do at least fifteen hours per week of practical laboratory work. By the performance of careful and systematic experiments the student will learn the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances and the conditions under which they give the best results. The more representative dyestuffs of each class will be applied to cotton, wool and silk, and each student will be obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy, most of the dye trials will be made upon small skeins or swatches of the required material, but from time to time the students will be required to dye larger quantities.

By the use of a small printing machine the principles of calico printing, and by the introduction of small dyeing machines, vats, etc. the practical side of the subject will be studied, and it will be the constant endeavor of those in charge, to impart such information of a theoretical and scientific character as is usually difficult to obtain in a dyehouse.

CHEMICAL PHILOSOPHY.

This will be a continuation of the Stoichiometry of the first year. It will include a general consideration of matter, the principles of



GENERAL CHEMISTRY LABORATORY.

hydrostatics, including the laws of specific gravity, and pneumatics, calorimetry, specific heat, vapor density, the important laws of solution, and the various methods of determining molecular weights.

The student will be required to deduce formulae, and work out a large number of problems introduced by the subject

ADVANCED INORGANIC CHEMISTRY.

The whole subject of inorganic chemistry will be reviewed during the second year, and many advanced topics will be introduced which were necessarily omitted from the first year course in General Chemistry.

ORGANIC CHEMISTRY.

This subject, which was introduced during the latter part of first year general chemistry, will be continued during the whole of the second year as a special subject. The study will be taken up in a thorough manner and by the end of the year the student will understand the composition of the important artificial dye-stuffs and the equations representing the reactions involved in their manufacture.

It will include lectures, recitations and laboratory work.

INDUSTRIAL CHEMISTRY.

This subject will be taken up during the third year, particular attention being paid to those branches which are of special interest to the textile chemist, as oils, soaps, the gas and coal tar industry building materials, and the manufacture of the important chemical compounds, acids, alkalies, bleaching powder, various mordants, etc., on a large scale.

The course will be illustrated as far as possible with experiments, specimens, diagrams, and charts, and the students will be given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

ADVANCED TEXTILE CHEMISTRY AND DYEING.

This will be a continuation of the Textile Chemistry and Dyeing of the second year, and will include a review of the second year's work, with the introduction of many advanced subjects; such as dye testing, calico printing, comparative dye trials, and numerous problems that arise in the dye house.



DYEING LABORATORY.

The course will include a large amount of work in the dyeing laboratory and will be supplemented by trips to a number of the large dye houses and print works in the vicinity.

QUANTITATIVE ANALYSIS.

This subject is taken by all regular Chemistry and Dyeing students, and extends through the second and third years of the course

The Second Year Work consists of a thorough training in the general principles of analytical work, the ground covered being practically that found in "Talbot's Quantitative Analysis". Each student is assigned a desk in the laboratory for his sole use, and is required to perform a large number of analyses independently.

The Third Year Work is designed to give the student sufficient experience to allow him to deal intelligently with technical problems. The laboratory work will consist of the analysis of such substances as lubricating oils, alkalies, soaps, coal, water, bleaching powder, lime, etc.

Microscopy,

The students in this course will be given a certain amount of microscopy. The work will include instruction in the use of the microscope, examination and detection of various fibres, and the preparation of slides.

• THESIS. ✓

Upon completion of this course, each student is required to present a thesis and do a certain amount of original work on some subject appropriate to this department. When this thesis has been accepted by the head of the department, and examinations successfully passed in all required subjects, the student will be entitled to the regular school diploma.



CALICO PRINTING MACHINE AND STEAMING BOX.

Register of Day Students.

THIRD YEAR, COURSE.

Baldwin, A. L.	IV	Lowell, Mass.
Barr, I. W.	I	" "
Bodwell, H. A.	II	Andover, Mass.
Brickett, C. J.	II	Haverhill, Mass.
Hanley, C. F.	V	Worcester, Mass.
Lamson, G. F.	I	Lowell, Mass.
Perkins, J. E.	III	Pittsfield, Mass.
Pradel, A. J.	III	Collinsville, Mass.
Sleeper, R. R.	IV	Lowell, Mass.
Smith, S. E.	I	Lawrence, Mass.
Stewart, A. A.	II	Lowell, Mass.
Syme, J. F.	II	Worcester, Mass.
Thompson, H. J.	IV	Lawrence, Mass.
Trull, J. C.	III	Lowell, Mass.

SECOND YEAR,

Bennett, E. H.	V	Saugus, Mass.
Buchan, D. C.	II	Andover, Mass.
Brown, H. W.	II	Newport, N. H.
Burnham, F. E.	IV	Reading, Mass.
Cranska, L. B.	I	Moosup, Conn.
Dowling, J. A.	II	Malden, Mass.
Ewer, N. T.	IV	Reading, Mass.
Foster, C. E.	II	Lowell, Mass.
Fowler, B.	I	Edenton, N. C.

Haskell, W. F.	IV	Westbrook, Me.
Hitchcock, T. B.	I	Boston, Mass.
Kingsbury, P. F.	IV	Lowell, Mass.
Kerr, L. R.	III	" "
Leach, Jr. J. P.	I	Littleton, N. C.
Marinel, W. W.	I	No. Chelmsford, Mass.
Moorhouse, W. R.	IV	Lewiston, Me.
Parker, B. M.	I	Raleigh, N. C.
Parker, H. C.	III	Fitchburg, Mass.
Webber, A. H.	IV	Beverly, Mass.
Wise, P. T.	II	Malden, Mass.

FIRST YEAR,

Brower, A. V.	I	Utica, N. Y.
Carter, R. A.	IV	Reading, Mass.
Collins, P. C.	I	Hillsboro, N. C.
Craig, C. E.	III	Lowell, Mass.
Curran, C. E.	III	Lawrence, Mass.
Currier, J. A.	II	No. Andover Depot, Mass.
Ferguson, A. F.	I	Roxbury, Mass.
Hargroves, W. W. Jr.	I	Drivers, Va.
Honiker, J. J.	III	Bennington, Vt.
Leyland, T. W.	IV	West Medford, Mass.
Lincoln, H. A.	I	Brookline, Mass.
Minge, J. C.	I	Faunsdale, Ala.
Otsuka, W.	V	Ise, Japan.
Swift, E. S.	I	Lowell, Mass.
Taylor, C. S.	II	Worcester, "
Terry, H. K.	II	Quincy, "
Totoki, H.	V	Tokio, Japan.
Towers, F. G.	III	Lawrence, Mass.
Webb, Jr., J.	I	Hillsborough, N. C.
Weston, S. D.	IV	Providence, R. I.
Woodman, H. L.	I	Lowell, Mass.
Youngman, G. M.	II	Newberry, Pa.



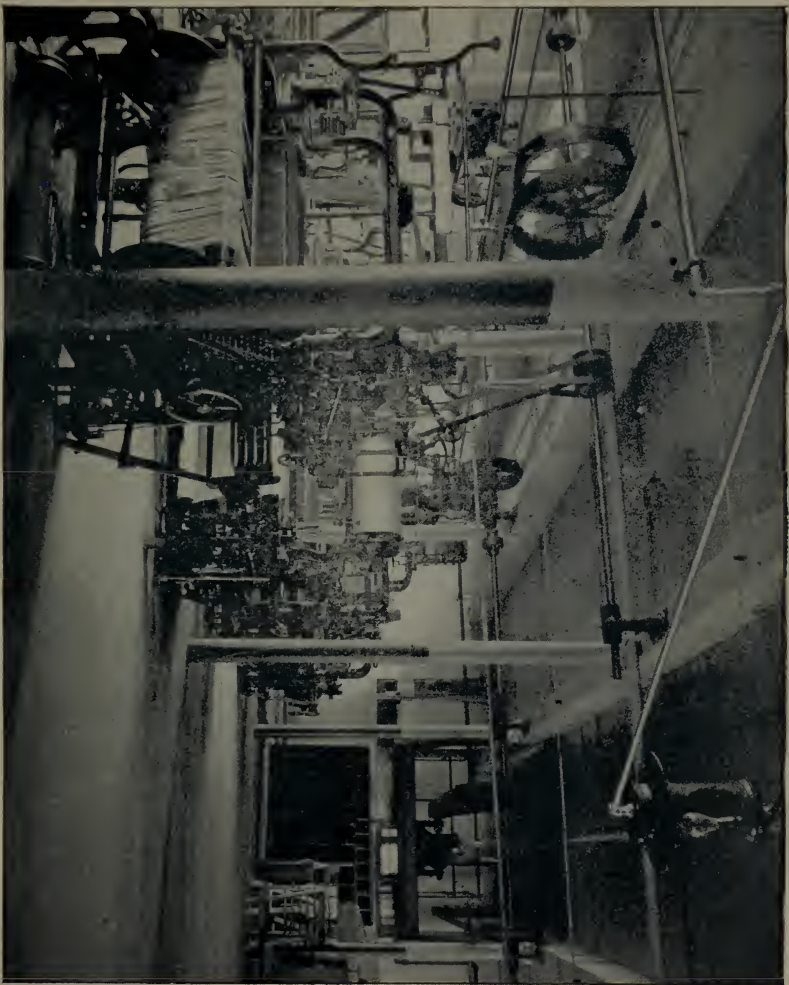
NORTHROP LOOM.

Art and Designing Course.

Burrage, Miss Katharine	Post Graduate.	Lowell, Mass.
Campbell, Miss L. E.	3d Year.	" "
Cuttle, P.	1st "	" "
Goodhue, Miss A. H.	3d "	Dracut, Mass.
Grindle, F. A.	1st "	Lowell, Mass.
Harmon, Miss L. M.	1st "	Springfield, Mass.
Lakeman, Miss F. S.	3d "	Salem, Mass.
Merchant, Miss E. C.	3d "	Lowell, Mass.
Stratton, W. E.	1st "	Jamaica Plain, Mass.
Walker, Miss A. G.	1st "	Lowell, Mass.
Whitaker, Miss H. B.	1st "	Tyngsborough, Mass.
Woodies, Miss I. A.	3d "	Lowell, Mass.

Specials.

Barker, Mrs. E. H.	Lowell, Mass.
Blanchard, W.	" "
Breene, Miss E. M.	" "
Burnham, Miss A. A.	" "
Everett, W. E.	" "
Gorman, Miss M. A.	" "
Green, Miss A. C.	" "
Langford, Mrs.	Lawrence, Mass.
Lennon, Miss K. T.	Lowell, Mass.
Mahoney, Miss N. C.	" "
McCarthy, Miss K. F.	" "
Newell, Miss Inez	" "
Norris, R.	Lawrence, Mass.
Owen, Miss F. A.	Lowell, Mass.
Robinson, J. W.	" "
Rowlandson, Miss B. M.	" "
Samuels, Miss I. L.	" "



POWER WEAVE ROOM.

Evening Students.

	COURSE.	YEAR.	
Armitstead, A. B.	IV	1	Lowell. Mass.
Aspinall, W.	II	1	Lawrence. Mass.
Barker, A.	V	1	" "
Barnes, J.	IV	1	Lowell. Mass.
Barnette, W. L.	I	2	" "
Barry, E. J.	III	1	" "
Bauer, H.	III	2	Lawrence. Mass.
Binns, H.	IV & II	1 & 2	Lowell. Mass.
Bixby, W. H.	IV	1	" "
Blinkhorn, R. I.	I	1	" "
Boardman, H. P.	I	1 & 2	" "
Bond, E.	III	1	Methuen. Mass.
Bond, J. W.	III	1	" "
Bowen, E. L.	I	1	Lowell. Mass.
Bowker, J. W.	III	1	" "
Brainerd, I. L.	I	1	Lawrence. Mass.
Bramhall, F. E.	IV	2	Lowell. Mass.
Bray, C. T.	III	2	Methuen. Mass.
Bridges, F.	I	1	Lowell. Mass.
Brooks, N.	III	2	" "
Brower, A. V.	I	1	Utica, N. Y.
Brown, A.	III	1	Lowell. Mass.
Brown, J. P.	III	2	" "
Brown, W. C.	I	1	" "
Burlen, L. W. Jr.	II	1	Lawrence. Mass.
Burnham, F. E.	IV	1	Reading. Mass.
Buzzell, W. O.	III	2	Methuen. Mass.
Cahill, C. E.	II	1	Lowell. Mass.
Campbell, A. D.	II	2	Lawrence. Mass.

Carter, H. T.	I	1	Lowell, Mass.
Cawthra, A.	II	1 & 2	" "
Ceetham, J. J.	III	2	" "
Chippindale, E. W.	II	1	" "
Clark, W. J.	II	1	" "
Claus, E. F.	III	2	" "
Clayton, R.	V	1	" "
Cochran, W. S.	III	1	" "
Colby, A. D.	I	3	" "
Collier, J.	II	2	Dracut, Mass.
Conlin, T.	V	1	Lowell, Mass.
Contu, Pierre	III	1	" "
Coughlin, J. J.	I	2	" "
Coughlin, M. A.	V	1	" "
Cowdell, H.	V	1	" "
Creaser, J. H.	IV	1	" "
Creen, H.	II	1	" "
Crockett, D. B.	I	1	" "
Crompton, G.	IV	2	" "
Crompton, H.	II	2	Methuen, Mass.
Cropper, J.	V	1	Lowell, Mass.
Crysler H. S.	II	2	" "
Cullinan, M.	I	3	" "
Currier, J. A.	II	1	N. Andover Depot, Mass.
Curtin, D.	II	1	Lowell, Mass.
Davis, H.	II	1	" "
Day, R. M.	II	1	" "
Dennison, S. J.	IV	1	" "
Devine, J. J.	IV	1	" "
Dickson, T. A.	IV	1	" "
Dignan, E.	III	1	" "
Dixon, H.	II	2	No. Chelmsford, Mass.
Dolphond, A.	V	1	Lowell, Mass.
Donnelley, J.	I	3	" "

Donohoe, J.	IV	1	Lowell. Mass.
Drummond, J. F.	IV	1	Lawrence. Mass.
Dudley, G. E.	I	1	Lowell. Mass.
Duffie, P.	V	3	" "
Duffy J. B.*	V	1	Ea. Chelmsford. Mass.
Dupee. C. F.	I	1	Lowell. Mass.
Elston. F. R.	III	3	Lawrence. Mass.
England. W.	II	1	Lowell. Mass.
Ennis, A. R.	I	1	" "
Evison, W. A.	V	1	" "
Ewer, N. T.	III	1	Reading. Mass.
Farrington, P. P.	IV	1	Lowell. Mass.
Fish. G.	III	2	" "
Foster, J. W.	V	1	" "
Fowler, B.	IV	1	Edenton. N. C.
Frame, W.	V	1	Lowell. Mass.
Furlong. J. H.	V	1	" "
Gagan, J.	V	1	" "
Gaunt. W. F.	III	1	Methuen. Mass.
Geary, J. W.	IV	3	Lowell. Mass.
Glynn, J. J.	III	1	" "
Good. H.	I	1	" "
Goyette, A.	I	1	" "
Grant. A.	II	1	" "
Grogan. G. H.	III	1	Cambridge. Mass.
Grouke. M.	II	1	Lowell. Mass.
Haggerty, J.	IV	1	" "
Haigh. W.	III	1	" "
Haley, J. J.	IV	1	" "
Hargroves, W. W. Jr.	I	1 & 2	Drivers. Va.
Harris A. M.	I	1	Lowell. Mass.
Harrison. S.	V	1	" "
Harvey. A. W.	V	1	" "
Haskell, W. F.	III	1	Westbrook. Me.

Hayes, L. C.	III	1	Lowell, Mass.
Healey, J.	II	1	" "
Healey, T. H.	I	1	" "
Higson, H.	III	1	" "
Hill, D.	I	1	" "
Hill, J. F.	I	1	" "
Hitchcock, T. B.	I	1	Boston, Mass.
Hodges, O.	II	1	Lawrence, Mass.
Holgate, B.	III	1	Lowell, Mass.
Hollingworth, R. H.	III	1	" "
Horn, H. G. W.	III	1	" "
Houston, W. A.	I	1	" "
Howard, F.	III	1	Lawrence, Mass.
Howard, J.	V	3	Lowell, Mass.
Howard, W. G.	IV	1	" "
Humphrey, R. D.	I	2	" "
Hunter, R.	III	2	Medford, Mass.
Hutton, C.	V	3	Lowell, Mass.
Ingalls, G. W.	III	1	" "
Jackman, J. J.	IV	1	Methuen, Mass.
Johnson, E. A.	III	1	Lawrence, Mass.
Johnson, G. I.	III	1	Lowell, Mass.
Jones, A. E.	I	1	" "
Jones, W. J.	II	1	" "
Joubert, J.	I	1	" "
Kellett, I.	Post Graduate	II	Lawrence, Mass.
Kelley, M.	I	1	Lowell, Mass.
Kennedy, M.	I	1	" "
Kenney, G. F.	I	1	" "
Kershaw, W.	V	3	" "
Killerby, W.	II	1	" "
Kirwin, T. J.	V	1	" "
Knapton, S.	IV	2	" "
Knowles, F. E.	V	1	" "

Lake, W.	V	1	Lawrence, Mass.
Lamson, G. F.	III & I	3	Lowell, Mass.
Law, A.	II	1	Lawrence, Mass.
Leach, J. P. Jr.	III	2	Littleton, N. C.
Leary, C. P.	V	1	Lowell, Mass.
Lee, C.	I	1	" "
Leith, E.E.	III	1	" "
Lemire, A.	I	1	" "
Lenihan, P.	V	1	" "
Lewis, R. D.	V	1	Lawrence, Mass.
Livingston, H. R.	IV	2	Lowell, Mass.
Lord, W.	III	2	Lawrence, Mass.
Lyman, A. R.	V	1	Lowell, Mass.
Lynds, F. H.	III	1	" "
Maden, H.	II	2	" "
Marjerison, I. D.	II Post Graduate.		Lawrence, Mass.
Marshall, A.	V	3	" "
Marshall, F. P.	III	1	Auburndale, Mass.
McDermott, C.	I	2	Lowell, Mass.
McDermott, F. G.	II	1	" "
McDermott, M.	V	1	" "
McDonald, H.	II	1	" "
McGovern, Miss M. C.	III	1	" "
McGregor, W. S.	II	1	Lawrence, Mass.
McGuigan, J.	II	1	Lowell, Mass.
McKeon, H.	I	1	" "
McLendon, W. J.	III	1	" "
McLeon, H. F.	V	1	" "
McQuade, H. B.	V	1	" "
Meehan, J. P.	V	1	" "
Mevis, E.	V	1	" "
Midwood, C. N.	III	1	" "
Minge, J. C.	I	2	Faunsdale, Ala.

Monahan, S. F.	IV	1	Lowell, Mass.
Morris, F.	V	1	" "
Mosley, H. W. Jr.	II	2	" "
Mowatt, A. W.	III	1	" "
Murkland, P.	V	3	Lowell, Mass.
Myers, James	IV	2	" "
Myers, John	III	1	" "
Nelson, E.	II	2	" "
Nevins, J.	V	1	" "
Newhallge, I. H.	IV	1	" "
Nicol, L. A. O.	III	1	" "
Noble, J. T.	III	2	" "
Noonan, D. T.	V	1	Lawrence, Mass.
Nugent, T. A.	IV & II	1 & 2	Lowell, Mass.
O'Brien, P.	V	1	" "
Ogley, S. A.	II	2	" "
O'Neil, E. T.	V	1	" "
Ortel, C.	V	1	" "
Osgood, C. F.	I	3	" "
Parker, H. C.	V	3	Fitchburg, Mass
Parsons, W.	V	1	Lowell, Mass.
Patterson, F. G.	II	2	Lawrence, Mass.
Peel, H.	II	1	" "
Perrin, A.	II	1	" "
Phelps, W. E.	I	1	Lowell, Mass.
Pickering, H. E.	I	3	" "
Pickup, T. W.	IV	1	" "
Pillsbury, S. G.	I	1	" "
Potter, F.	III	1	" "
Potter, I.	I	1	" "
Potter, R.	III	1	" "
Pradel, A. J.	III	3	Collinsville, Mass.
Provencher, C. E.	V	1	Lowell, Mass.
Puffer, G. F.	IV	2	" "

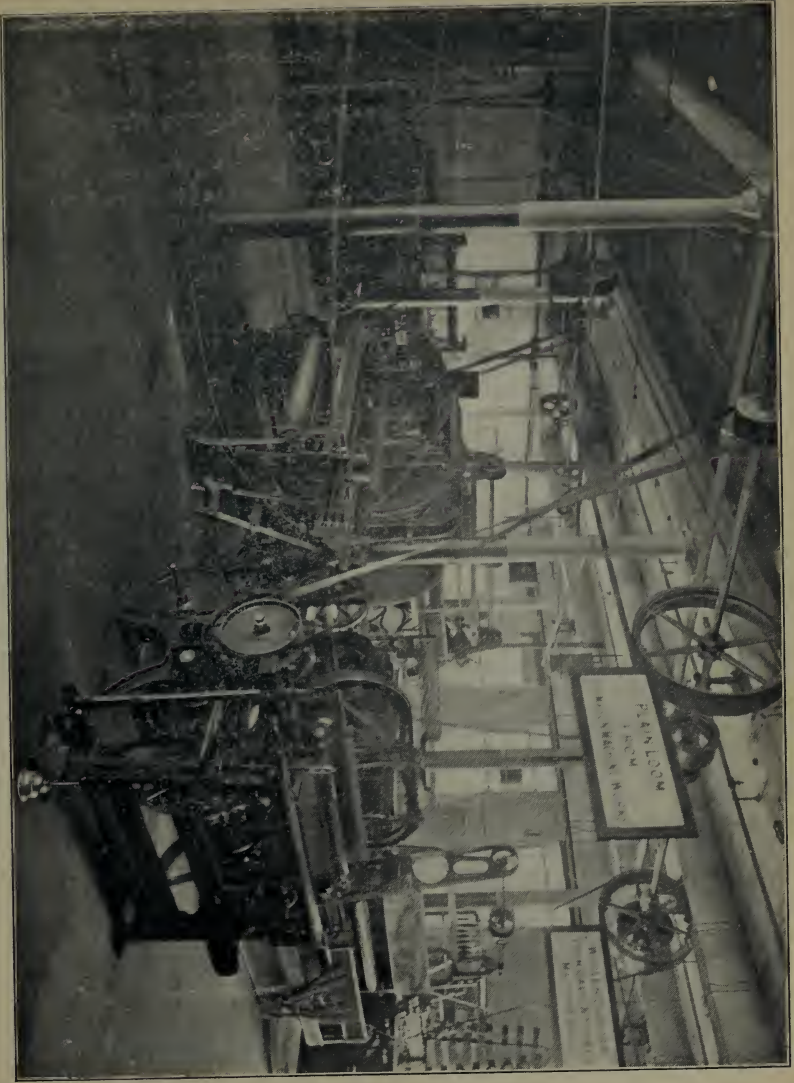
Rand, W. C.	III	1	Lawrence, Mass.
Reinhardt, E. C.	III	1	Pontoonsuc, Mass.
Renwick, J. A.	IV	1	Lowell, Mass.
Reynolds, H. L.	V	1	" "
Reynolds, J.	V	1	Lowell, Mass.
Richardson, A. T.	IV	1	" "
Robey, L. H.	I	1	" "
Robinson, L. E. H.	III & IV	1	" "
Roche, W. G.	IV	1	" "
Rowell, H. C.	I & II	3	" "
Salisbury, C. A.	V	1	Lawrence, Mass.
Saunders, E. B.	III	2	Lowell, Mass.
Scanlon, E. J.	II	1	Lawrence, Mass.
Scarlott, G.	I	2	Lowell, Mass.
Schofield, J. S.	V	1	Lawrence, Mass.
Scott, G. S.	V	1	Lowell, Mass.
Sedden, N. G.	V	1	Lawrence, Mass.
Seiferth, O. F.	V	1	Methuen, Mass.
Shannon, P.	V	1	Lowell, Mass.
Shea, P. H.	III	1	" "
Silcox, A. E.	I	3	" "
Smalley, H.	I	2	" "
Smith, F.	II	1	Lawrence, Mass.
Smith, P. M.	I	2	Lowell, Mass.
Snow, F. L.	IV	3	" "
Spencer, W. H.	V	1	" "
Sterling, A.	III	1	" "
Stevenson, W.	III	1	No. Billerica, Mass.
Stewart, A. A.	III	3	Lowell, Mass.
Stokham, B. I.	IV	1	" "
Stopherd, W. H.	II	1	" "
Sullivan, J. F.	II	1	Lawrence, Mass.
Sweeney, J.	I	1	Lowell, Mass.
Swift, E. S.	III	1	" "

Tarrant, J.	II	1	Lowell, Mass.
Taylor, A.	V	1	Lawrence, Mass.
Taylor, C.	V	1	Worcester, Mass.
Thomas, H.	III	1	Lowell, Mass.
Toohey, F. J.	V	1	Lowell, Mass.
Trollope, H.	IV	1	" "
Trueworthy, E. P.	V	1	" "
Tuttle, G. C.	III	1	" "
Tyrrell, W. B.	III	1	" "
Underhill, E. J.	II	1	" "
Varney, M. H.	III	1	" "
Vezina, W.	III	1	" "
Vogt, A.	I	2 & 3	Lawrence, Mass.
Walker, D.	III	1	Collinsville, Mass.
Wardrobe, W. L.	I	2	Lawrence, Mass.
Waterhouse, J.	IV	3	Lowell, Mass.
Webb, J. Jr.	III	1	Hillsboro, N. C.
Welch, W. H.	III	1	Lowell, Mass.
Wesson, P. B.	I	3	Tyngsborough, Mass.
Weston, S. D.	V	1	Providence, R. I.
Wetherbee, S. B.	III	1	Lowell, Mass.
Whitaker, F.	II	1	Andover, Mass.
White, C. E.	IV	1	Lowell, Mass.
Whitehead, B.	II	1	Lawrence, Mass.
Willey, F. S.	I	2	" "
Williamson, I. F.	IV	2	Lowell, Mass.
Wing, C. T.	III	3	" "
Wise, P. T.	I	1	Malden, Mass.
Wood, J.	I	1	Lowell, Mass.
Woodbury, W. S.	I	3	Lawrence, Mass.
Woodcock, T.	III	1	Lowell, Mass.
Woodley, G. F. Jr.	IV	1	" "
Woodman, H. L.	V	1	" "
Worth, S.	I	1	" "

SUMMARY.

Day Students..	85
Evening Students..	266
	<hr/>
	351
Names Counted Twice..	20
	<hr/>
	331





POWER WEAVE ROOM.

GRADUATES, DAY CLASSES,

WITH TITLES OF THESES.

Diploma Courses.

Isaac Walwin Barr. I. Lowell. Mass.

The Effect on the Breaking Strength of Yarn Produced by Varying Conditions of Draft and Twist.

Arthur Lincoln Baldwin. IV. Lowell. Mass.

An Experimental Research to Determine the Quantity of Indigo Deposited upon the Fibre.

Henry Albert Bodwell. II. Andover. Mass.

Details of the Manufacture of a Ten Run Woolen Yarn. (with A. A. Stewart.)

Chauncey Jackson Brickett. II, Haverhill. Mass.

Investigation of Scaife or Builder Motion on a Worsted Spinning Frame.

George Francis Lamson. I. Lowell. Mass.

A Comparison of Evenness and Strength of No. 25 Warp Yarn Employing Two and Three Processes of Drawing.

John Edward Perkins, III, Pittsfield. Mass.

The Setting and Reeding of a Perfect Fabric.

Alois Joseph Pradel, III, Collinsville, Mass.

Cloth Construction.

Robert Reid Sleeper. IV, Lowell. Mass.

An Experimental Research to Determine the Fastest and Cheapest Direct Cotton Black.

Stephen Eaton Smith. I. Lawrence. Mass.

Investigation of Evenness of Product and Amounts of Waste made in Cotton Carding.

Arthur Andrew Stewart, II, Beauharnois P. Q.
(with H. A. Bodwell, see above.)

James Francis Syme, II, Worcester, Mass.

The Dobby in Relation to Weaving.

Henry James Thompson, IV, Lawrence, Mass.

The Action of Alkaline Solutions upon Various Grades of Wool
in the Process of Wool Felting and Scouring.

For Partial Courses.

Certificates were awarded as follows:

ONE YEARS' POST GRADUATE COURSE IN DECORATIVE ART AND DESIGNING.

Katharine Burrage, Lowell, Mass.

THREE YEARS' COURSE IN DECORATIVE ART AND DESIGNING.

Laura Etta Campbell,	Lowell, Mass.
Fanny Shillaber Lakeman.	Salem, Mass.
Amy Helen Goodhue,	Dracut, Mass.
Edith Clara Merchant,	Lowell, Mass.
Ida Alberta Woodies,	Lowell, Mass.

THREE YEARS' COURSE IN COTTON SPINNING AND WEAVING.

John Pelopidas Leach, Jr., Littleton, N. C.

THREE YEARS' COURSE IN WEAVING.

Harry Carmi Parker, Fitchburg, Mass.



FANCY LOOMS.

List of Evening Students Graduated

May 16, 1900.

Campbell, A. D.	II	Lawrence, Mass.
Cawthra, A. B.	II	Wigginville, Mass.
Colby, A. D.	I	Lowell, Mass.
Donnelley, J.	I	" "
Elston, F. R.	III	Lawrence, Mass.
Howard, J.	V	Lowell, Mass.
Hutton, C.	V	" "
Jones, W. J.	II	" "
Maden, H.	II	" "
Nelson, E.	II	" "
Ogley, S. A.	II	" "
Osgood, C. F.	I	" "
Rowell, H. C.	I & II	" "
Silcox, A. E.	I	" "
Snow, F. L.	IV	" "
Wardrobe, W. L.	I	Lawrence, Mass.
Waterhouse, J.	IV	Lowell, Mass.
Wing, C. T.	III	" "
Woodbury, W. S.	I	Lawrence, Mass.





JACQUARD LOOMS.

Contributions or loans of machinery, apparatus or material, kindnesses extended or assistance rendered by the following firms or persons are acknowledged with thanks :—

Actien Gesellschaft fur Anilin Fabrikaten, Berlin.
Altemus, W. W., Philadelphia, Pa.
Ameledema Oilless Bearing Co., Philadelphia, Pa.
American Card Clothing Co., Lowell, Mass.
American Crayon Co., Lowell, Mass.
American Drosophore Co., Boston, Mass.
American Woolen Co., Boston, Mass.
Appleton Co., Lowell, Mass.
Arabol Mfg. Co., New York City.
Arlington Mills, Lawrence, Mass.
Atlas Mfg. Co., Newark, N. J.
Atwood Machine Co., Stonington, Conn.
Avery Chemical Co., Littleton, Mass.
Badische Anilin und Soda Fabrik, Germany.
Barbour Bros., Boston, Mass.
Bartlett & Dow, Lowell, Mass.
Bay State Mills, Lowell, Mass.
Beach & Co., Hartford, Conn.
Bennett, Frank P., Boston, Mass.
Berry, A. Hun, Boston, Mass.
Boott Mills, Lowell, Mass.
British Alizarin Co., England.
Capron, C. C., Uxbridge, Mass.
Carruthers, Robert, Lowell, Mass.
Carey, W. W., Lowell, Mass.
Clark, Jeremiah, Lowell, Mass.
Coats, J. & P., Pawtucket, R. I.
Coburn, C. B. & Co., Lowell, Mass.
Coburn Shuttle Co., Lowell, Mass.
Consolidated Prior Cotton Gin & Wool Burrer Co., London, Eng.

Crompton-Knowles Loom Works, Worcester, Mass., and Providence, R. I.

Davis & Furber Machine Co., North Andover Depot, Mass.

Draper Co., Hopedale, Mass.

Entwistle, T. C., Lowell, Mass.

Emmons Loom Harness Co., Lawrence, Mass.

Factory Insurance Association, Hartford, Conn.

Farbenfabriken of Elberfeld Co., New York, N. Y.

Firth, Wm., Boston, Mass.

Furbush Machine Co., Philadelphia, Pa.

Gates, J. & Son, Lowell, Mass.

General Fire Extinguisher Co., Providence, R. I.

Gherli, A., New York, N. Y.

Gilbert Manufacturing Co., Gilbertville, Mass.

Gilbert Loom Co., Worcester, Mass.

Hamilton Mills, Lowell, Mass.

Hamilton Print Works, Lowell, Mass.

Harris, G. W.; Lowell, Mass.

Harwood, G. S. & Son, Boston, Mass.

Holyoke Machine Co., Worcester, Mass.

Howard Bros., Worcester, Mass.

Haworth & Watson, Lowell, Mass.

Jacques Shuttle Co., Lowell, Mass.

Johns, H. W. & Co., New York, N. Y.

Kalle & Co., New York, N. Y.

Kalle & Co., Boston, Mass.

Kittredge, H. G., Boston, Mass.

Kitson Machine Co., Lowell, Mass.

Knowles Loom Works, Worcester, Mass.

Kunhardt, Geo. E., Lawrence, Mass.

Laminar Fibre Co., Cambridge, Mass.

Lawrence Manufacturing Co., Lowell, Mass.

Leominster Woolen Co., Leominster, Mass.

Leopold, Cassella, Germany.



DECORATIVE ART DEPARTMENT.

Lewiston Machine Co., Lewiston, Me.
Leyland Belting Co., Lawrence, Mass.
Lowell Manufacturing Co., Lowell, Mass.
Lowell Machine Shop, Lowell, Mass.
Lyon, A. S., Lowell, Mass.
Main Belting Co., Boston, Mass.
Massachusetts Co., Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Merrimack Co., Lowell, Mass.
Mather & Platt, England.
Mathieson, W. J. & Co., Boston, Mass.
Mauger & Avery, Boston, Mass.
Meister, Lucius & Brunning, Germany.
Montgomery, J. R. Co., Windsor, Conn.
Nat. Assn. of Wool Mfrs., Boston, Mass.
New England Bunting Co., Lowell, Mass.
N. E. Cotton Mfrs. Assn., Boston, Mass.
New York & Boston Dyewood Co., Boston, Mass.
Olney Bros., Providence, R. I.
Pacific Mills, Lawrence, Mass.
Parker, W. H. & Sons, Lowell, Mass.
Phillips & Co., Providence, R. I.
Pickering Knitting Co., Lowell, Mass.
Pickhardt & Kuttroff, Boston, Mass.
Prince, Smith & Son, Keighly, England.
Read, Holiday & Co., Boston, Mass.
Roy, B. S. Worcester, Mass.
Royle, John & Son, Paterson, N. J.
Roessler & Hasslacher Chemical Co., New York.
Sargent's Sons, C. G., Graniteville, Mass.
Schoelkopp Aniline & Chemical Co., Buffalo, N. Y.
Shaw Stocking Co., Lowell, Mass.
Star Worsted Co., Fitchburg, Mass.
Steel Heddle Co., Philadelphia, Pa.

Stevens, M. T. & Sons., No. Andover, Mass.
Stirling Mills, Lowell, Mass.
Stoddard, Haserick & Richards, Boston, Mass.
Sturtevant, B. F. Co., Jamaica Plain, Mass.
Sullivan Machinery Co., Claremont, N. H.
Talbot Mills, North Billerica, Mass.
Talbot Dyewood & Chemical Co., Lowell, Mass.
Thompson Hardware Co., Lowell, Mass.
Tillinghast, Stiles & Co., Providence, R. I.
Tolhurst, W. H. & Son, Troy, N. Y.
Torrence Mfg. Co., Harrison, N. J.
Tremont & Suffolk Mills, Lowell, Mass.
Union Shuttle Co., Lawrence, Mass.
United States Aerophor Air Moistening Co., Providence, R. I.
United States Bunting Co., Lowell, Mass.
Victor, Koechl & Co., Boston, Mass.
Walsh, Thomas, Lowell, Mass.
Warren Mills, Centreville, R. I.
Washington Mills, Lawrence, Mass.
Wattles, L. R. Canton Junction, Mass.
Whiting, Henry F., Lowell, Mass.
Whitin Machine Works, Whitinsville, Mass.
Whitely, John & Son, Halifax, England.
Williams Roving Carrier Co., Naugatuck, Mass.
Woodley, Soap Manufacturing Co., Foxboro, Mass.



❁ ADDENDA. ❁

As this catalogue goes to press; there comes to us word that Frederick Fanning Ayer, Esq., formerly of Lowell, and now of New York City, has made the generous donation to the fund for new buildings for the School of \$35,000; making the State grant of \$35,000 dependent upon raising a like amount outside, immediately available. Work will be commenced as soon as possible, and under the immediate supervision of the Trustees, will leave nothing to be desired for the success of the school.



ADDITIONS TO BOARD OF TRUSTEES.

HONORARY TRUSTEE,

Frederick Fanning Ayer.

TRUSTEE,

Frank E. Dunbar, Attorney-at-Law.

Lowell Textile School.

LOWELL, MASS.

APPLICATION BLANK.

Date.....

I..... hereby
apply for admission to the Lowell Textile School.

Name in full.....

Date and place of birth.....

Home residence.....

Parent or guardian.....

Residence

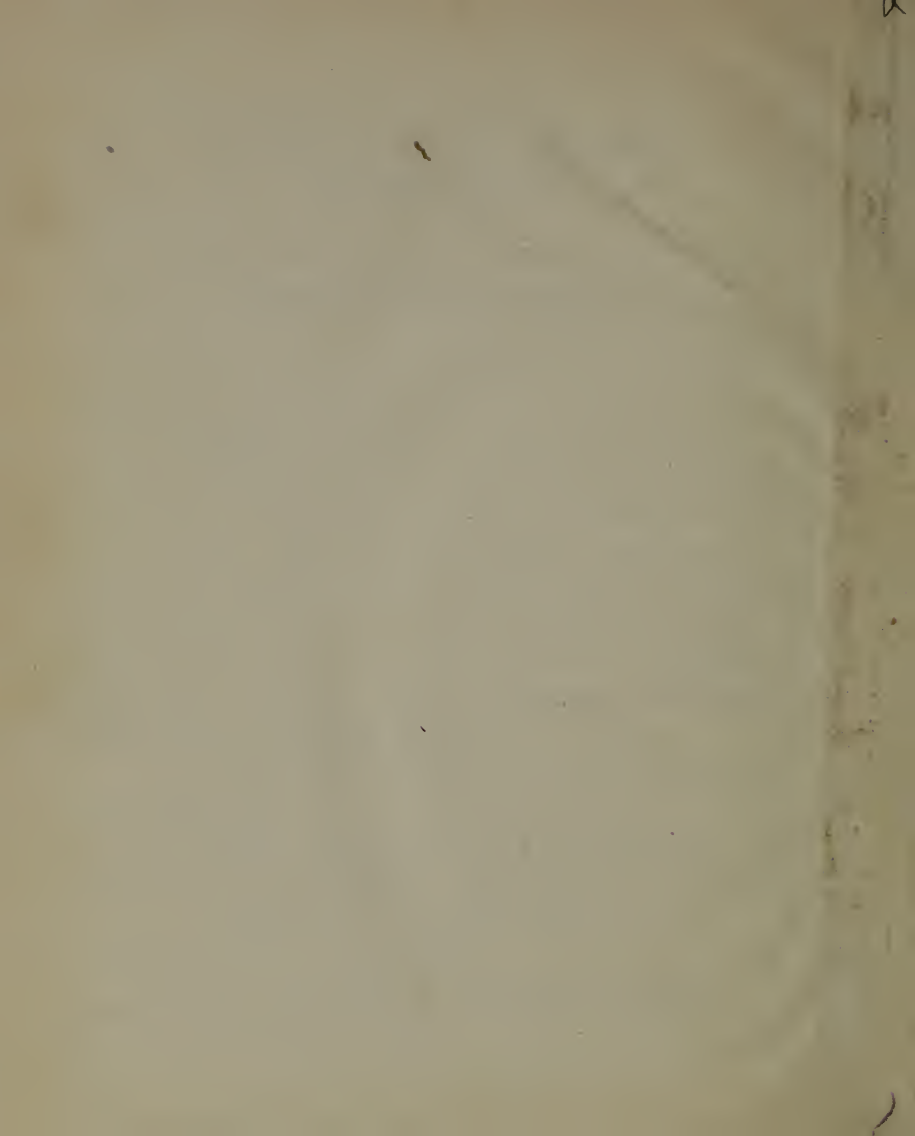
School last attended

Course to be pursued at Lowell Textile School
(not absolutely necessary to choose till the end of first term.)

DAY	{	I. Cotton Manufacturing.	EVEN- ING.	{	I. Cotton Spinning.
		II. Wool Manufacturing.			II. Woolen & Worsted Spin'g.
		III. Designing.			III. Designing.
		IV. Chemistry and Dyeing.			IV. Chemistry and Dyeing.
		V. Weaving.			V. Weaving.
					VI. Mechanical Evening.

Fill out the above and send to

WM. W. CROSBY, Principal.



WELLS BINDERY
WALTHAM, MASS.
DEC. 19/9

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Bulletin of the
Lowell Textile
Institute

1897-1901

